DOCUMENT RESUME

ED 265 926 PS 015 560

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TITLE The State of the World's Children, 1986.
INSTITUTION United Nations Children's Fund, New York, N.Y.
PUB DATE 86
NOTE 99p.; For other reports, see ED 253 302 and ED 258 687.
AVAILABLE FROM Oxford University Press, Humanities and Social Sciences, 200 Madison Avenue, New York, NY 10016 (Hardcover, $19.95; Paper, $6.95).
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Children; *Developing Nations; Foreign Countries; Global Approach; *Health Programs; *Immunization Programs; Infant Mortality; *Infants; *Mothers; Nutrition; Program Effectiveness; Tables (Data)

ABSTRACT

This special UNICEF report documents the range of problems behind the decline of living standards in Africa and describes the practical steps which are being taken to confront the crisis. Discussed are (1) increasing implementation of immunization programs and progress in promoting oral rehydration therapy; (2) the impact on child survival and development of growth checking, improved weaning, promotion of breast-feeding, and prevention of vitamin A deficiency; (3) basic child survival strategies which would considerably improve the lives and health of women; (4) the potential and danger inherent in the idea of "self-health"; and (5) the present need and present opportunity to provide a basic minimum protection for the lives and growth of all the world's children at a very low cost and in a very short time. Tables present basic statistics concerning factors related to infant mortality. In addition, brief case studies or "Panels" are inserted into the text provide illustrative examples of effective programs in numerous developing nations and additional information concerning immunization, iodine, parasites, population trends, vitamin A, and the International Code of Marketing of Breast-milk Substitutes. (RH)

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THE STATE OF THE WORLD'S CHILDREN 1986

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THE STATE OF THE WORLD'S CHILDREN
1986

The State of the World's Children 1986
UNICEF, Division of Communication and Information,
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The State of the World's Children 1986 is published in book form by Oxford University Press. The book includes 'Lifelines', an extensive reference section, and a complete statistical appendix.
For details, see back cover.

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Reaching all children

ORT and immunization are therefore leading the way towards a revolution in child survival and development – made possible by a range of low-cost methods including growth checking, improved weaning, the promotion of breast-feeding, and the prevention of vitamin A deficiency. But the potential of this new knowledge can only be realized if ways and means can be found to put it at the disposal of all parents. This is the 'social breakthrough' which many countries are also now making. *page 20*

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Because it depends on parents as front-line health workers, the move towards a child survival revolution is part of a wider shift in the concept of health care. In both industrialized and developing worlds, the next generation of advances in human health will come about not through more medical technology but through ordinary people knowing more and doing more about their own and their families' health. This process is basic to primary health care, but its potential should not be used as an excuse for governments to abrogate responsibility for providing essential services and attacking the social and economic causes of ill health. *page 48*

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The physical and mental development of children is intimately related to the social and economic development of nations. Today's children must not be made to bear the burden of difficult economic times. Broadly applicable and low-cost methods of enabling parents to improve child health are now available. With present knowledge, and with international support, it is therefore possible to achieve, in the next few years, one of the greatest goals which mankind has ever set for itself – basic protection for the lives and normal development of all its children. *page 70*

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THE STATE OF THE WORLD'S CHILDREN 1986

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PREFACE

The range of issues which could legitimately be included under the title *The State of the World's Children* is clearly wider than the focus of this year's report.

In particular, the effects of economic recession continue to reverberate through the world's poorest communities as increasing unemployment and falling real wages bear down most heavily on those who spend the highest percentage of their income on necessities – the poor. At the same time, government cut-backs on such vulnerable items of expenditure as health clinics and food subsidies also leave exposed those who are most dependent on such services – again the poor. As a result, progress for children is being slowed down in some nations and thrown into reverse in others.

Last year a special UNICEF study – *The Impact of World Recession on Children* – detailed the process by which the heaviest burden of economic recession is in most cases passed on to those who are least able to sustain it. This year, evidence of the continuing impact of that process on the lives of the poorest children is continuing to come in (see, for example, Figs. 21 and 22 in the main text of this report).

Most immediately, this crisis for the poorest is surfacing in sub-Saharan Africa where, as all the world has witnessed, the failure of development – and of the rains – has pushed hundreds of thousands of families to the margins of survival and beyond. Because of the diversity and complexity of this crisis, UNICEF has this year published a separate report on the problems now facing the poorest communities, and particularly the children, of Africa.

Such problems have been exacerbated rather than caused by immediate pressures such as recession and drought. Even in years of normal rainfall, many millions of children are growing up deprived of what most people reading this page would consider to be basic necessities of life – adequate food, clean water, safe sanitation, basic education, and competent health care.

But faced with a myriad diverse problems, and an almost hopeless shortage of resources for dealing with them, those charged with the responsibility of trying to bring about practical improvements in the lives of children have no choice but to make some decisions about priorities.

The problems of poverty are infinitely complex. The causes, as is well known, are political, economic, social, historical, geographical, agricultural... But what is required now is not a more refined and sophisticated analysis of poverty but more practical and effective ways of empowering people to liberate themselves from it.

To achieve that means identifying practical starting-points. For the problem is less likely to succumb to a complete and comprehensive set of solutions which have to be realized all at once than to a structured series of achievable goals which, while being important in themselves, also help to lead the way, step by achievable step, towards more comprehensive long-term progress.

To find such beginnings, it is vital to pool the accumulated knowledge of a generation of development efforts and to use this past experience to sharpen the attack on present problems.

In the process, many of those most closely involved are coming to the conclusion that we are now faced not only with great difficulties but also with a very great opportunity. For it is clear that there are now several low-cost and potentially very powerful ways of protecting the lives and the normal development of many millions of children in ways which are politically and financially feasible even in such difficult economic times. The coincidence of technical and social advances which has created this opportunity is relatively new, and its potential is therefore vastly underexploited.

That is why this year's State of the World's Children report focuses on a limited number of achievable aims such as universal immunization, the spread of oral rehydration therapy (ORT), and the low-cost prevention of malnutrition – aims which are relevant to the needs of children now as well as to longer-term goals.

In this context, the reasons for selecting these particular priorities may be simply explained:-

◯ Taken together, vaccine-preventable infections, diarrhoeal disease, and poor nutritional health, constitute by far the most important problem in any objective consideration of the 'state of the world's children'. Common to almost all developing countries, they account for the great majority of the 15 million infant and child deaths in the world each year and are the principal cause of both physical and mental disability.

◯ The technology and the knowledge to solve these problems are now available at a cost which most nations and most families could afford even in hard economic times – especially with a modicum of international support.

◯ Most important of all, the techniques and knowledge involved are cheap and simple enough for parents and communities to be principal participants. In other words, it is now possible to recruit literally hundreds of millions of effective health workers with the highest possible motivation for the protection of children's lives and growth.

◯ Most low-income countries have, in recent years, built up the channels of communication and organization which now make it possible to reach, inform, and support the vast majority of families in applying today's knowledge. This is the 'social advance' which, combined with recent advances in knowledge, creates a new potential.

Only by involving millions of people in knowing more and demanding more and doing more about their own and their families' health can low-cost technical solutions such as ORT and immunization fulfil that potential. But precisely for that reason, the promotion of these basic health actions can also be an important contribution towards participation in more comprehensive primary health care strategies. For as this year's report shows, working towards a vital and immediate goal such as immunization for all children offers an almost unparalleled opportunity for popular, professional, and political mobilization of a kind and on a scale which is relevant to almost any other kind of progress against poverty, ill health, and underdevelopment.

For all of these reasons, this report focuses on this new opportunity – and on those specific and concrete measures which can contribute to long-term solutions at the same time as doing something on a very significant scale – *for children in need today*.

As the panels interspersed throughout this year's report show, these strategies are constantly being refined by reality. For although techniques such as immunization represent common solutions to common problems, the more difficult task of mobilizing a society to actually bring about the immunization of all its children is a task which is inevitably specific to each country and each culture.

The important common factor is therefore not the technique but the approach. There are important goals which can be achieved for children now. There are ways in which every one of us can help to advance those goals. And in doing the possible today, we take one more step towards achieving the impossible tomorrow.

Within Human Reach~

a future for Africa's children

This special UNICEF report documents the range of problems behind the decline of living standards in Africa and describes the practical steps which can and are being taken to confront the crisis. The major argument of the report is that the neglect of the 'human dimension' is a major cause of Africa's present problems and that solutions will depend on finding ways to liberate and enhance the contribution which individual men and women make to the development of the continent.

The report is available in English and French, free of charge, from UNICEF Headquarters (866 UN Plaza, New York, NY 10017, USA), from UNICEF Headquarters for Europe (Palais des Nations, CH-1211 Geneva 10, Switzerland), from national and regional UNICEF offices, and from National Committees for UNICEF.

Infant Mortality Rate

The infant mortality rate (IMR) is the number of deaths before the age of one year – per 1,000 live births.

Figures given for the infant mortality rates of particular countries, in both the text and statistical tables of this report, are estimates prepared by the United Nations Population Division on an internationally comparable basis, using various sources. In some cases, these may differ from national estimates.

Most national IMR figures are collected every five or ten years as part of the national census and do not yet reflect the impact of any of the recent campaigns and child survival programmes mentioned in the text.

Immunization leads the way

Despite the continuing crisis in Africa,* there is dramatic progress to report this year on the struggle to improve the lives and the health of many millions of the world's children.

In the last eighteen months, several nations have doubled and trebled their levels of immunization against the vaccine-preventable diseases which were killing almost 4 million children a year and leaving another 4 million permanently disabled. Throughout 1985, world-wide demand for vaccines has been running at approximately three times its 1983 level[1] and the annual number of child deaths being prevented by vaccines is now estimated to be approaching one million a year (Fig. 1).

With the continuing and rapid uptake of oral rehydration therapy (ORT),** the new figures mean that the lives of well over one million children have been saved – in the last twelve months – by the recent spread of two of the least expensive of all child protection techniques.

Immunization for all by 1990

This sudden acceleration in immunization coverage has been made possible, in large part, by new strategies for reaching a much greater proportion of a nation's parents than are normally touched by modern health services. Together with improved vaccine technologies and the training of many thousands of immunization teams in the 1980s, these new outreach strategies now offer a new chance to bring immunization to the vast majority of the world's children within the next few years.

Acting on this information, the Secretary-General of the United Nations has taken the unprecedented step of writing to the presidents or prime ministers of all 159 member states, drawing their attention to this new potential and asking for their personal support for the goal of immunization for all the world's children by the year 1990 (Fig. 2).***

Several nations are already moving to within striking distance of that goal. As against an average of less than 5% immunization coverage for the children of the developing world only a few years ago, coverage rates against some or all of the vaccine-preventable diseases have recently been pushed to 60%, 70% or even 80% in Pakistan and Turkey, in El Salvador and the Dominican Republic, in Bolivia and Brazil, in Colombia and Nicaragua, in Burkina Faso and Lesotho, in Saudi Arabia and Zimbabwe, and in parts of India and China.

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* UNICEF has this year published a special report on the continuing crisis facing the children of Africa (see box in preface for details).

** Oral rehydration therapy (ORT) is a simple technique for preventing and treating the diarrhoeal dehydration which claims the lives of approximately 4 million children each year and is the leading cause of child death in the developing world (see Lifelines: ORT). UNICEF estimates that the spread of the technique is already saving over 500,000 children's lives each year.

*** The target of providing immunization for all children by 1990 was adopted by the World Health Assembly in 1977 and is one of the key elements of the World Health Organization's overall goal of 'Health for All by the year 2000'.

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Immunization: a new surge forward

Examples from the last eighteen months of achievements and commitments in the struggle towards the immunization of all children by 1990:-

○ In **India**, Prime Minister Rajiv Gandhi has announced this year that immunizing every child born in India is to be the 'living memorial' to the memory of his mother, the late Indira Gandhi. When that monument is built (target date 1990), it will save the lives of over 1 million Indian children each year. To date, districts in Delhi and Karnataka have used new approaches to raise their immunization rates from less than 20% to more than 80% in little more than a year.

○ In **China**, the last eighteen months have seen immunization rates lifted from 40% to 90% in parts of five provinces with a total population of 90 million – and the President has this year announced that this achievement will be extended to reach 85% immunization coverage (against six major diseases) in *all provinces* of China by the end of 1988.

○ In **El Salvador** this year, three separate days of cease-fire were observed by both sides in the civil war so that two-thirds of the nation's 400,000 unimmunized young children could be protected against five major infectious diseases on three National Vaccination Days. Bringing the first Vaccination Day to an end on 3 February 1985, El Salvador's President Duarte announced: "*We have had a day of peace, a day of life, a day of hope*" (see panel 4).

○ In **Turkey** two months ago (September 1985), the President launched the first of three ten-day campaigns to immunize 80% of the nation's young children against five of the major vaccine-preventable diseases by the end of the year. In the first eight days of the first round (11 to 18 September 1985), at least 3 million children were vaccinated (see panel 3).

○ In the **Dominican Republic**, where national immunization days have already vaccinated almost 95% of children against polio and measles, full immunization against five of the major diseases of childhood is expected to be achieved by the middle of 1986. (see panel 7).

○ In **Brazil**, the largest immunization campaigns ever held have virtually eliminated poliomyelitis by immunizing 20 million children on each of two National Vaccination Days every year for the last five years. In 1984, measles and DPT vaccines were added and nation-wide coverage has now risen to over 60% with a target of 95% for 1985. To reach that target will mean immunizing more than 25 million children against five of the major vaccine-preventable diseases (see panel 10).

○ In **Colombia**, following the successful 1984 campaign which reached almost 800,000 children and raised the nation's immunization rates to more than 75% for five of the vaccine-preventable diseases, President Belisario Betancur has announced that: "*We are going to keep immunizing our children until there are no more cases of vaccine-preventable diseases*" (see panel 5).

○ In **Ecuador**, the first phase of a national vaccination campaign went into action on 26, 27 and 28 October (1985) with the aim of immunizing 80% of the nation's under-ones (and 95% of those aged one to five) against the six major vaccine-preventable diseases.

○ In **Bolivia** this year, immunization rates have been pushed to over 70% for polio and to 65% for diphtheria, whooping cough, and tetanus (see panel 8).

○ In **Pakistan**, the percentage of children under five fully immunized against the major diseases has risen from less than 5% in the early 1980s to approximately 65% today (with coverage rates of 80% in the Punjab but considerably lower in areas like Baluchistan). According to the World Health Organization: "*the lives of more than 170,000 infants will be saved yearly ... as a result of the stepped up immunization campaign now under way in Pakistan*". (see panel 11).

(Continued in next panel)

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In all, approximately 40 nations with approximately two-thirds of the developing world's children are rapidly accelerating their vaccination programmes and now have a realistic chance of immunizing almost all their young children by the year 1990.

Immunization and oral rehydration therapy (ORT) are therefore beginning to lead the way towards the revolution in child survival which has been the main theme of this report for the last three years.

It is a revolution made possible by new knowledge about how parents themselves might take action to protect the lives and normal development of their children against some of the worst effects of the poverty into which they are born.

It is a revolution based on a small number of relatively simple and inexpensive methods which are now known to exert powerful leverage on child health – methods like ORT and immunization, breast-feeding and improved weaning, maintaining vitamin A levels and checking weight gain, avoiding low birth-weights and leaving longer intervals between births.

It is a revolution which could reduce child deaths and child malnutrition by half, in many nations of the world, over the next seven or eight years.

It is a revolution which could help to reduce births as well as deaths and so contribute to the slowing down of population growth (see panel 25).

It is a revolution which is already beginning in several of the nations whose commitment and achievements are briefly summarized in the panels on the left-hand pages of this year's report.

Above all, it is a revolution which depends largely on the commitment of a nation's leadership and on the mobilization of a nation's organized resources in order to break present knowledge and techniques out of the medical chest and put them into the hands of many millions of parents.

Recent achievements in extending immunization coverage from less than 20% to more than 80% of a nation's children therefore have a double importance for the 'state of the world's children'. Not only have these sharply accelerated immunization programmes saved tens of thousands of lives and prevented tens of thousands of disabilities, they have also pioneered new ways of *taking known solutions to basic health problems and putting them at the disposal of the majority of those who need them.*

And it is precisely this task – the task of making available on a massive scale *what is already known* – which could now help to bring about a

Fig. 1 Estimated annual numbers of deaths and prevented deaths from vaccine-preventable diseases (children under 5)

Estimated deaths from all vaccine-preventable diseases 3,450,000

Estimated deaths prevented by immunization

Note: The above estimates are calculated from data relating to years between 1981 and 1984.

This year, substantially improved data on the numbers of vaccine-preventable deaths have been published by the World Health Organization. Previously, the figure of approximately 5 million a year has been most commonly used – based on estimates made by WHO in the mid-1970s. The improved and updated data (applying to the year 1983), based on a narrower definition which admits only those deaths directly attributable to specific vaccine-preventable diseases, shows that immunization coverage has increased to the point where vaccines are preventing approximately 800,000 deaths each year. As a result of these changes, WHO now estimates that vaccine-preventable diseases kill a total of 3,450,000 children each year in the developing world. The new figure does not include China, where generally well- nourished child populations and improved levels of vaccine coverage probably mean that deaths from vaccine-preventable diseases are proportionally less than in most developing nations.

Source : Report of the Expanded Programme on Immunization, Global Advisory Group Meeting, Copenhagen, November 1985.

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Immunization: a new surge forward (cont.)

2

○ In **Sri Lanka**, where an expanded programme of immunization has already reached well over half the nation's children, the President and Prime Minister have launched a new drive (6 September 1985) and committed the government to universal immunization before the end of 1986 (see panel 18).

○ In **Viet Nam**, the national immunization programme is being accelerated to reach an extra 573,000 children in the last three months of 1985 (in addition to the 353,000 children reached each year by regular immunization programmes), so taking the national coverage rate to nearly 70% for the first time.

○ In **Nigeria**, a campaign has begun (October 1984) to repeat, nation-wide, the successful trials in Ondo state where coverage was raised from less than 10% to more than 80% in less than twelve months. Initial results from the capital cities of all 19 states of Nigeria show that eight to ten times as many children are being vaccinated each month as were reached in the the corresponding months of 1984 (see panel 17).

○ In **Tanzania**, immunization coverage has been pushed to 56% for polio, 82% for measles, and 54% for tuberculosis.

○ In the **Sudan**, Africa's largest country, 200,000 children in the capital city of Khartoum have been immunized this autumn (1985) and the Minister of Health has announced that "*the Khartoum campaign marks the beginning of a campaign to reach 90% of Sudan's children by 1990*". On present plans, 80% of Sudan's children will be immunized against the biggest killer – measles – by March 1986.

○ In **Ethiopia**, the Minister of Health has launched (13 February 1985) a campaign to immunize every child in Addis Ababa against the main vaccine-preventable diseases and every pregnant woman against tetanus. By September 1985, over 50% of the city's children had already been reached (see panel 15).

○ In **Somalia**, a presidential directive (9 June 1985) has requested all regions to prepare for immunization drives to repeat the successes in the cities of Hargeisa and Mogadishu where more than 80% of children under two have been immunized this year (see panel 14).

○ In **Syria**, nurses and students working in their vacations have succeeded in lifting immunization coverage from 3% to 63% in the Raqqa area – one of the most remote and inaccessible governorates in the country.

○ In **Burkina Faso**, a presidential decision of 19 September 1984 led to the mounting of operation 'Vaccination Commando' in which Committees for the Defence of the Revolution throughout the country brought almost 65% of the nation's children to be immunized with the 'single-shot' vaccines against measles, meningitis, and yellow fever. The usual epidemics, in which thousands of children die and tens of thousands of children fall seriously ill, have thereby been prevented – giving the health services a breathing-space in which to build towards a system of regular immunizations for all children against the major vaccine-preventable diseases (see panel 6).

○ In **Suriname**, immunization coverage has risen to over 80% after the proclamation of the National Vaccination Act which now requires that all children under the age of one be immunized against diphtheria, whooping cough, tetanus and polio.

○ In the Gulf, **Oman** has reached an immunization level of 70% by means of campaigns in July and October 1985. The United Arab Emirates has now reached 80% coverage of its children. And Saudi Arabia has moved its immunization rates from 33% in 1980 to 75% in 1984.

○ In Kabul, **Afghanistan**, this year, immunization rates among the capital city's children have been pushed from less than 20% to more than 80% against all six vaccine-preventable diseases.

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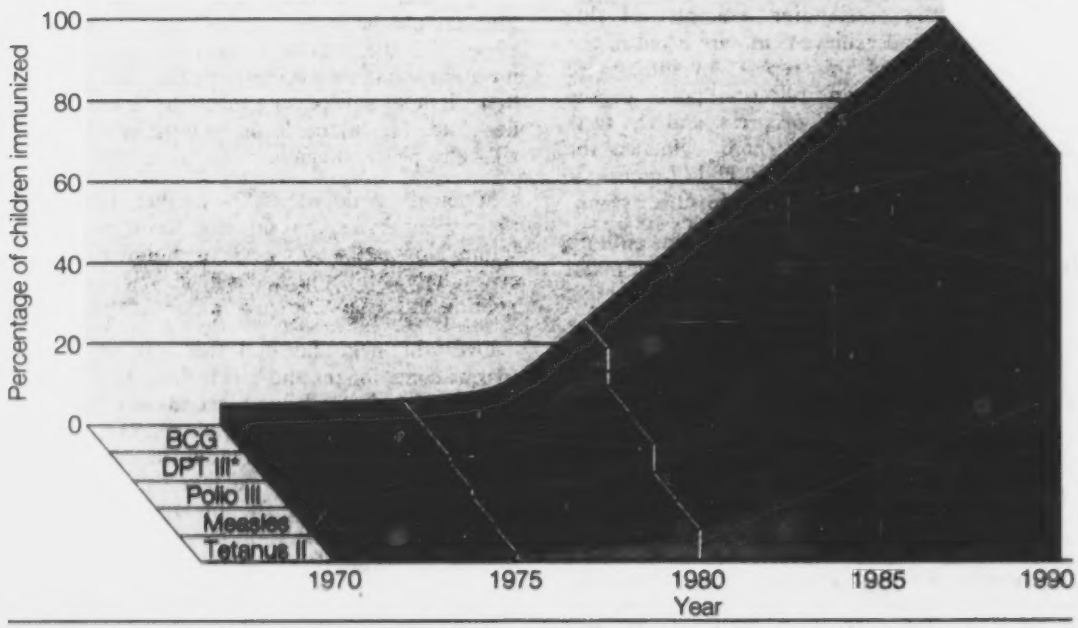
revolution in child survival and protect the normal growth and development of many millions of today's children and tomorrow's citizens. For in an often unjust world, a major improvement in the protection afforded to the children of the poor is unlikely to come about through any steep rise in incomes for the poorest third of the human family for at least the next ten or fifteen years. Protecting lives and health, during that time, will therefore continue to depend, for the most part, on the kind of care which families and communities are able to provide. And it is in that setting that recent breakthroughs assume such importance. For it is now possible for families themselves to quite drastically increase their children's chances of survival and normal growth – *if* the ways and means can be found to put that knowledge at the disposal of the majority.

In the process, large numbers of parents are also becoming involved in putting flesh and blood on the bones of the primary health care idea. By knowing more and demanding more and doing more about such basic health strategies as immunization and ORT, large numbers of people are finding a practical starting-point from which to progress, step by achievable step, towards the larger goal of more comprehensive primary health

Fig. 2 Immunizing all children by 1990: progress achieved and progress required

The target of universal child immunization by 1990 was adopted by the World Health Assembly in 1977 and is one of the key elements in the World Health Organization's overall goal of 'Health for All by the year 2000'.

The lighter tints show the actual rate of progress (1970–83) in immunizing children (under one year) in the developing world. The heavier tint indicates the required rates of progress (1983–90) if the target of universal immunization is to be met by 1990. 1983 is the latest year for which international data is available.



Note: To promote universal immunization, the World Health Organization (WHO) launched its Expanded Programme on Immunization (EPI) in 1974.

* Numerals indicate the number of vaccinations required for immunization.

Source: Report of the Expanded Programme on Immunization, Global Advisory Group Meeting, Copenhagen, November 1985.

DPT = Diphtheria, Pertussis (whooping cough), Tetanus. Tetanus II: Two tetanus injections are required in pregnancy to protect against tetanus of the newborn which accounts for the vast majority of infant tetanus deaths in the developing world. Tetanus II coverage therefore applies to pregnant women.

care and a greater degree of control over their own and their families' health.

This year's *State of the World's Children* report therefore turns first to an account of this upsurge in immunization rates, of how they are being achieved, and of what lessons they might hold for putting other basic child protection techniques at the disposal of the majority of parents.

The meaning of immunization

Immunization coverage today ranges between 20% and 40% of the developing world's children (Fig. 4) – despite the theoretical availability of vaccines to a much greater proportion of their populations. But in the last eighteen months to two years, several nations have effectively committed themselves to immunization coverage of a different order of magnitude.

Some of the outstanding examples of this commitment – and achievement – are listed in the first two panels of this report. In sum, these examples represent an inflection point in the graph of immunization's progress, and the facts and figures cited are the hard evidence for UNICEF's belief that universal child immunization by 1990* is no longer an impossible dream.

But lest the percentages and the millions become meaningless, this is what it means if immunization is not available:-

At first it may mean that a child who is slightly malnourished begins to lose his or her appetite and feel the beginnings of a small fever. After a day or two, the fever is higher, appetite is gone, coughing begins, and a vivid florid rash is appearing on the skin as if from nowhere. As the days pass, the diarrhoea begins, the skin dries, and the rash spreads until the eyes also become infected and inflamed. By the second week, the rash has begun to peel, leaving open raw sores on the skin, and by now the coughing is persistent and prolonged and the diarrhoea is unremitting. No food is being taken, and water, salts, and nutrients are draining from the weakened body. Dehydrated to the point where the thirst is unbearable and racked by coughing fits which are becoming too weak to clear the lungs but too strong for the muscles of the small heart, the lights of the body begin to go out.

In this way, measles killed 2 million children in 1985.

Or it may mean that a mother notices that her four-day-old baby seems suddenly to feel more tense. As she wonders whether she is only imagining that something is wrong, she sees the first slight spasms passing through the muscles of her child. The infant sleeps, its muscles relax, and all seems peaceful again.

When the child wakes, the mother speaks and the response is a spasm shooting through the tiny frame. Now every noise, every small disturbance, every comforting touch, produces fierce spasms, holding the baby rigid, arching its small back.

Over the next day and the next night, the spasms come longer and more often, holding the baby locked rigid for long seconds at a time. All contact produces another spasm and even breast-feeding has to stop. In between, the baby visibly weakens. No fluids can be taken in, no mucus cleared from the lungs. By now, the spasms have spread to the muscles of the mouth and the mother is looking down on an agonized grin.

Another night and day and the spasms are making impossible demands on the baby's heart. Now the whole body is being held rigid, the tiny fists clenched, the face fixed in grimace, the back arched, the stomach locked like iron, the small chest clamped down against all breathing. For thirty slow seconds the small body is locked in this

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* In practice no country, even in the industrialized world, has ever achieved 100% immunization of its children. 'Universal' immunization is therefore best interpreted as implying the ideal that no child should be denied immunization against tuberculosis, diphtheria, pertussis (whooping cough), tetanus, poliomyelitis, and measles. It is, however, generally agreed that when immunization coverage reaches a figure of 80% or more then disease transmission patterns are so severely disrupted as to provide a degree of protection even for the remaining children who have not been immunized (providing that the majority of the unimmunized population are not concentrated into areas where overall coverage consequently remains low).

It is also important that children are immunized during the first year of life and that levels of immunization are sustained so that each new generation is protected.

vice, then slowly relaxes, muscles twitching as they loosen their grip and the spasms recede.

A gentle, comforting touch and immediately a total body spasm locks the child rigid all over again, as if it were repelled by its mother's love.

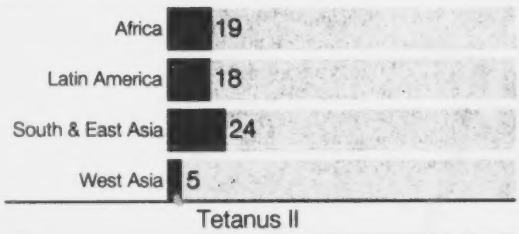
In this way, tetanus killed almost a million infants in 1985.

Or it means that a child, in any ordinary village or neighbourhood, begins to sniffle or cough with what seems like the beginnings of another ordinary cold. Over the next week, very slowly and almost unnoticed, the cough becomes deeper and more persistent. Suddenly, it is no longer ordinary. The coughing now is so rapid-firing, a stuttering engine pumping air from the lungs, that there is no time to take any inward breath as more and more air is hammered out until there is none at all left to fuel another cough and the child slumps forward, chest collapsed. Slowly, with a shudder, the child breathes in, relaxes the tension, and sits up again with sweating skin and frightened eyes.

At the next fit, the parents too are growing frightened as the child's face darkens and the coughing goes on and on until it seems that an inward breath will never be taken. Now, the whole body of the child is geared to the task of expelling air until, at the end, the child finally inhales uncontrollably, swallowing coughed-up mucus from the bronchial tree and choking from the vomit drawn into the lungs. With every fit now comes more vomiting as the muscles of the stomach contract with the coughing and force everything, food, drink, milk, back through the throat and nose – only to be inhaled chokingly as that inward breath is finally taken.

Weakened by vomiting and coughing, struggling to breathe through lungs blocked by mucus

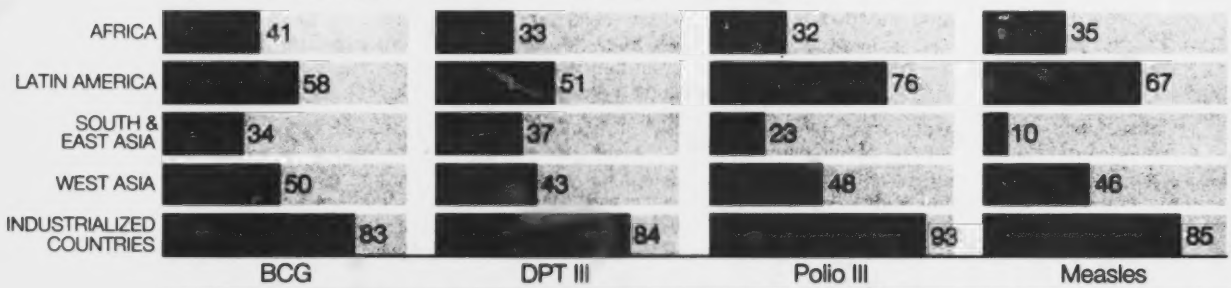
Fig. 3 Percentage of pregnant women immunized against tetanus



Note: Two tetanus injections are required in pregnancy to protect against tetanus of the newborn which accounts for the vast majority of infant tetanus deaths in the developing world.

Source: WHO (39 countries), UNICEF field offices (31 countries). Population Division of the United Nations (for population data).

Fig. 4 Percentage of children immunized in the first year of life



Note: The difference between the above percentages and the figures published in a similar table in last year's State of the World's Children report are accounted for by changes in the classification of countries by region and by recent improvements in data collection which have yielded more reliable and up to date figures for immunization coverage.

Source: WHO (67 countries), UNICEF field offices (52 countries). Population Division of the United Nations (for population data).

West Asia = Asia west of Iran
South & East Asia = rest of Asia (except China which is not included in this table).

DPT = Diphtheria, Pertussis (whooping cough), and Tetanus. In some countries DPT and polio are given in two doses only. In countries where measles vaccination is given after the age of 12 months, the figure used is the percentage coverage of 1 to 5 year olds.

Turkey: to immunize 5 million

3

"*Through this campaign, the high infant mortality rate in this country will drop,*" promised Turkish President Kenan Evren during a 11 September ceremony at which he immunized the first two infants in the country's nation-wide immunization drive. In three ten-day periods, the nation aims to immunize more than 80% of its 5 million under-fives against the diseases which are now killing more than 500 Turkish children every week.

From the same platform, Prime Minister Turgut Ozal announced that the campaign was "*the most important programme started by this government*". As he spoke, the valis (governors) of all of Turkey's 67 provinces were launching the campaign nation-wide by immunizing children in each provincial capital.

Immediately after the launch in Ankara, government ministers and deputy ministers from Egypt, Pakistan, the Sudan, and Syria met with President Evren to discuss immunizing all the children of their five nations before the end of this decade. Meanwhile, across Turkey itself, 35 million doses of vaccine had arrived at the 45,000 immunization stations and all 536 *kaymakams* (local district heads) were also immunizing children.

Over the next eight days (with 70% of the vaccination stations having reported in as this account goes to press), a total of 3.2 million children were vaccinated – two-thirds of the nation's under-fives.

If such progress can be sustained in the second and third rounds (October and November 1985) then Turkey will be on course for universal immunization by the end of 1986 – well ahead of the 1990 target date.

After briefings at UNICEF headquarters in New York, the Centers for Disease Control in Atlanta, and a visit to see Colombia's immunization campaign in action, a high-level Turkish government team returned to Ankara in April 1985 to make the key decisions for the campaign. The most important of those decisions was to attempt the mobilization of all the nation's resources to increase both the availability of, and *the demand for*, immunization.

The result, this September, was an unprecedented national effort headed by the Ministry of Health. For the first time ever, all 67 valis met together in Ankara – to be briefed on the leadership roles expected of them. The Turkish armed forces put their vehicles and communications facilities at the campaign's disposal. Turkish television gave the equivalent of $10 million in airtime and reached 30 million homes. National radio broadcast eight to ten immunization reminders a day and an average of six articles a day appeared in the press.

A total of 5,000 Rotarians from over 60 clubs – plus many members of the Turkish Red Crescent societies – volunteered their time and their cars. The national meat and fish company provided refrigerated long-distance trucks for transporting vaccines. A private company paid for 5 million 'passports to health' containing a child immunization record, a growth chart, and advice on basic child health care.

In the months leading up to September, imams and muhtars in 40,000 villages and neighbourhoods, helped by primary school teachers and their pupils, made sure that every household knew about the campaign. And as the date for the first round neared, sermons on immunization were preached in 54,000 mosques.

Achieving and sustaining full immunization is seen in Turkey as an important practical contribution towards the building of primary health care and the long-term development of the country. For as Health Minister Mehmet Aydin commented at the outset of the campaign:-

"*The time has come to take immediate action in the reduction of child mortality and the protection of child health, so as to entrust Turkey to a dynamic generation with better physical and spiritual health.*"

and food, the child begins another fit, uncontrollable coughing pumping the air unremittingly from the lungs, finally forcing the chest to collapse, slumping the child forward until the fit ends and the house is suddenly silent. Only this time, the child does not breathe in.

In this way, whooping cough killed more than half a million children in 1985.

The cost of protection against all this is approximately $5 per child. The cost of immunizing all children, and saving more than 3 million children from dying in this way, is approximately $500 million per year* – slightly less than the cost of three advanced fighter planes.

The two breakthroughs

Based on information available as of mid-1985, those countries accelerating their immunization programmes towards the 1990 goal include:- Argentina, Bangladesh, Bhutan, Bolivia, Botswana, Brazil, Burkina Faso, Chile, China, Colombia, Democratic Yemen, the Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Haiti, India, Indonesia, Iraq, Jordan, Lesotho, Nicaragua, Nigeria, Pakistan, Peru, Panama, Rwanda, Saudi Arabia, Senegal, Somalia, Sri Lanka, the Sudan, Suriname, Syria, Tanzania, Trinidad and Tobago, Turkey, the United Arab Emirates, Uruguay, Viet Nam, Yemen, and Zimbabwe.

This sudden surge of progress, a surge which will bring many nations within striking distance of universal immunization, is happening in the mid-1980s because of two different breakthroughs.

The first is a 'supply breakthrough' brought about by more heat-stable vaccines, by more reliable 'cold chains', by continuing research and training, by the installing of more equipment and supplies, and by the growing numbers of health workers trained in the management and organization of immunization programmes.[2] In the 1980s, there has been solid progress on all these fronts. The latest freeze-dried measles vaccines, for example, remain potent for up to three weeks even in tropical temperatures.[3] Cold chains of refrigeration – based on kerosene, bottled gas, electricity, solar energy, or ice boxes – are now in place in most nations. Most important of all, many thousands of immunization teams have been trained and fielded since the WHO launched the Expanded Programme on Immunization (EPI) in 1974. To date, almost 17,000 people from over 100 nations have been trained on courses sponsored by WHO and UNICEF and many times more have been trained by governments themselves. China alone, for example, has drawn on EPI programmes to train over 100,000 health workers in immunization management.[4]

But the second and equally important advance is the 'demand breakthrough' by which some thirty or forty nations are now mobilizing, on a massive scale, to make immunization available in practice and not just in theory. And it is political commitment to new ways of reaching out to inform and support the *majority of parents* which now offers new hope for putting into practice other child protection strategies on a scale which is commensurate with the problem.

To bring vaccination to people, to inform many tens of millions of parents of the when and the where and the why of immunization, and to get many more millions of children to the right place at the right time on several separate occasions each year, is a massive organizational and communications task which usually far exceeds the capacity and the experience of over-stretched medical services. In most developing nations, those medical services reach only about 20% or 25% of the people and are inevitably more concerned with meeting demand than creating it.

For all these reasons, comprehensive immunization coverage has risen only slowly, often reaching only one in five of a nation's children, even when vaccination services have been theoretically available to the majority for many years.[5]

Clearly, something extra is needed, some new dynamic, some new way of forcefully taking the

* Although more resources are needed if the goal of universal immunization by 1990 is to be met, finance is by no means the only restraint. If universal immunization is to be achieved and sustained, then it is also essential to find ways of overcoming the problems of management, training, supervision, education of the public, and organization of permanent immunization programmes.

El Salvador: children – a zone of peace

Salvadorian government and rebel soldiers briefly stopped shooting each other in 1985 while the nation confronted a common foe – the diseases which kill some 20,000 small children a year and maim many thousands more.

Three perilous day-long pauses in the fighting – so frail that edgy officials shied away from calling them cease-fires or truces – enabled some quarter of a million children under five to be vaccinated against polio, diphtheria, tetanus, measles and whooping cough.

The 'days of tranquillity' – agreed to by government and guerrilla leaders with the help of leading Roman Catholic prelates – almost fell apart on at least two occasions.

Hours before the opening of the second national immunization day, on Sunday 3 March, with 20,000 health workers and volunteers poised in more than 2,000 vaccination centres across the country, what officials euphemistically called a 'military incident' threatened an eruption of fighting that could have spilled over into the first day of the campaign and scared off many parents and children. Prompt intervention by representatives of the Roman Catholic Church prevented a collapse of the *de facto* truce.

Though the totals fell short of the target of vaccinating 80% of El Salvador's 400,000 unimmunized children under five, in round figures 217,000 children were reached on 3 February, 262,000 on 3 March and 241,000 on the last day.

But achieving the complete immunization of almost two-thirds of its children was rightly hailed as a remarkable achievement in a nation at war with itself.

"*This reconciliation for progress and the common good announced loudly El Salvador's commitment to a positive future and has been an inspiration to the rest of the world,*" United Nations Secretary-General Javier Pérez de Cuéllar said in a letter to President Napoleon Duarte of El Salvador.

The war was but one obstacle. With 58% of the rural population illiterate, even making parents aware of the immunization campaign was a major task.

House-to-house visits by 3,100 health workers to locate and inform parents increased between the first and second vaccination days and were largely credited for the increased number of children turning up to be immunized on 3 March.

Posters and printed handbills announced the dates for vaccination and even lottery tickets carried the campaign emblem and the slogan "*prevenir es ... vacunar*" – to vaccinate is to prevent. Other publicity included air drops of leaflets in remote areas. More conventionally, newspapers, magazines, radio and television stations carried many thousands of advertisements placed by government and by private businesses as well as feature articles and news stories on the campaign itself.

Each Sunday, during the weeks leading up to the vaccination days, the Church carried the message to the people from the pulpit, telling parents it was their duty to protect their children from disease.

The areas controlled by guerrillas received special treatment, with health workers from the International Committee of the Red Cross operating the vaccination posts. Posters advertised the vaccination days in those districts – but without giving the dates, because rebel authorities wished to avoid giving the impression of being dictated to by the government.

At one point, guerrillas abducted two doctors and took them to an unmanned health centre, where several parents and children waited to be vaccinated. The vaccines administered, the two physicians were returned to their homes.

world's most powerful public health technology off the pedestal of its vast potential and putting it to everyday work in a million villages and neighbourhoods.

Something special is needed. And something special is what the nations who are now moving towards full immunization have begun to pioneer in the mid-1980s:-

Social mobilization

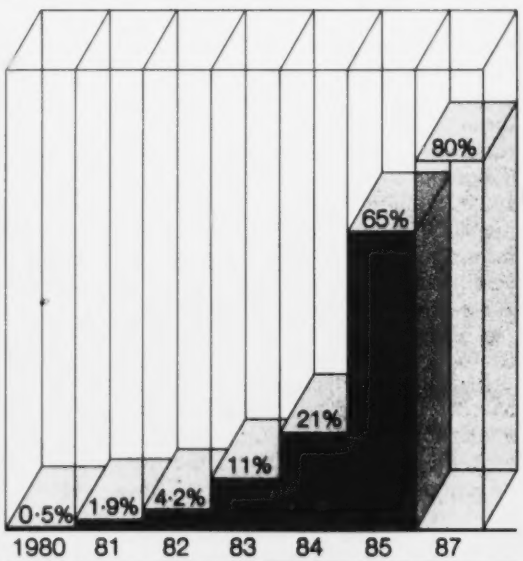
Brazil's National Vaccination Days, for example, have mobilized no less than 400,000 volunteers – from all sections of society – to support the health services in manning over 90,000 vaccination posts and bringing immunization within walking distance of almost every family. At the same time, the country's mass media have made sure that virtually every parent in the country is well-informed about the time, place, and importance of the immunization days themselves. On television and radio, 30-second immunization 'advertisements' have been broadcast twenty times a day. In the mass-circulation newspapers, pages of editorial have been devoted to the campaign for weeks in advance. On walls and in windows throughout the land, tens of millions of posters have kept the message in front of the public. On bank statements, electricity bills, and lottery tickets, the reminder has gone out that every child should be immunized. In supermarkets and football stadiums, the public address systems have announced the same message. And in 10,000 parishes, Catholic priests and the Church's 14,000 health workers have talked with millions of parents about vaccinating their children (see panel 10).

In India, the immunization of more than 80% of the young children in districts of Delhi and Karnataka has been achieved not just through the passive availability of vaccines, but through the active involvement of entire communities. To bring vaccination within the reach of all parents, immunization posts were set up in temples and schools and polling booths. To let parents know about the importance of vaccination, messages were carried by radio and newspapers, by poster and car sticker, by banner and procession, by song and play, by cinema and loudspeaker, by schoolteacher and village leader, by members of parliament and panchayat, by Rotary clubs and women's organizations, by Hindu and Methodist leaders, by youth movements and family planning associations, and by the hundreds of village volunteers who travelled house to house to make sure that all parents were aware of the need to vaccinate and to remind them of the time and place.

In Pakistan, 7,000 vaccinators and 15,000 traditional birth attendants have been trained and the number of immunization posts has been increased by 50% in the last eighteen months alone (Fig. 5 and panel 11).

In Nigeria, the pushing of the immunization rate in the test area of Owo from 9% to over 80% within twelve months – an achievement now being attempted in every state – was made possible by the support of the community leaders, the schoolteachers, the traditional chiefs, the mass

Fig. 5 Percentage of infants fully immunized, Pakistan, 1980–1987



Sources: WHO, Report of the Expanded Programme on Immunization, Global Advisory Group Meeting, Alexandria, October 1984. (1985 figure from UNICEF, Islamabad).

media, the Muslim leaders and imams, the Catholic bishops and priests, the international agencies and the local organizations (see panel 17).

In Colombia, the full immunization of 75% of all under-fours has been achieved by one of the most significant recent examples of mass participation in public health. Watched by observers from Haiti, El Salvador, Burkina Faso, and Ecuador, 10,000 immunization posts were set up across the nation – in health clinics, schools, civic centres, market-places and parks. To inform the nation's parents, almost all major newspapers and almost all radio and television stations promoted the campaign to a point where it was virtually impossible for anyone to be unaware of where and when and why children had to be taken for vaccination. To publicize and organize the three National Vaccination Days, 200,000 teachers made announcements in schools, over 2,000 priests preached immunization from pulpits in every parish, over 120,000 volunteers, plus the police and the armed forces, helped with the logistics of the campaign, and approximately 13,000 volunteers from the Colombian Red Cross assisted the health services with the actual vaccination of over three-quarters of a million children (see panel 5).

In El Salvador this year, the immunization of over a quarter of a million children was made possible by the government and the guerrillas, by the health services and the Catholic Church, by the Rotarians and the Boy Scouts, by the Red Cross societies and the international agencies, by 14,000 announcements on radio and television, by the 5,000 'promoters' who went house to house to inform parents of the campaign, and by the 20,000 vaccination-team members who manned over 2,000 temporary health posts across the nation (see panel 4).

In Kabul, Afghanistan, thousands of children have been immunized in mosques this year as the mullahs and the community leaders have joined with the health services and the mass media to quadruple the immunization rate among Kabul's children.

In Turkey, this year's campaign to immunize over 80% of the nation's children has involved not just the health services but the President and Prime Minister, several cabinet ministers, the Association of Paediatricians, and many different departments of both provincial and national government. The country's 220,000 primary school teachers began work three weeks early to help in the preparations for the campaign. The religious leaders (muftus and imams) delivered sermons in support of the immunization programme from 54,000 mosques. The military provided transport and fuel, the government's meat and fish warehouses provided cold storage for vaccines, and students at Hacettepe University took on the national surveys to evaluate vaccination coverage both before and after the campaign. In total, $10 million's worth of television and radio time has been donated to publicize the campaign (see panel 3).

In the Americas, the Director of the Pan American Health Organization (PAHO) has announced plans for a "*massive final five-year effort to achieve the eradication of polio from the Americas*".* In the words of PAHO's Director-General, Dr. Carlyle Guerra de Macedo, this can be achieved not by the health services acting alone but by "*tapping the voluntary organizations in every country, inviting the participation of the mass media, mobilizing individual families and communities ... and promoting a nation-wide effort in every country, dedicated to a common strategy, committed to a common goal ... for the time has come for us to say that it is unacceptable for any child in the Americas to suffer from polio*".[6]

The health services have provided the technology and the medical expertise for all these achievements. But that technology and know-how has been made available to 80% instead of 20% of the people because it has been fitted to the engine of social mobilization and geared to working through a whole range of organized resources with a 'social reach' going far beyond the usual outreach of the health services themselves. In this

* Almost all governments and international organizations involved – including WHO (of which the Pan American Health Organization is part), and UNICEF – share the view that polio immunization should be promoted not as an isolated venture but as a leading edge of progress towards the immunization of all children, by 1990, against all of the major vaccine-preventable diseases included under the EPI.

way, in nation after nation, it is proving possible to inform and involve the majority of parents and to help both create and meet a much louder demand for the immunization of children.

Immunization and primary health care

These extraordinary efforts are of course attended by a turbulence of concerns about their sustainability, about the complacency they may temporarily induce, and about their place in advancing the broader goal of more comprehensive and permanent primary health care services.

Sustainability is a legitimate worry. A change of government or of a key minister, a falling-off of interest by the media, a failure to educate new parents about the importance of immunization – any and all of these can mean a dwindling away of coverage rates and the sudden return of tetanus, measles, whooping cough, or polio.

Another worry is that the boosting of immunization coverage to two or three times its previous level will be considered achievement enough. If that happens, then the idea of immunization for all will not be carried right through to the point where it reaches those who are the hardest of all to reach, those who belong to the very poorest 30% of society, those whose lack of money and time and information and confidence means that they are usually left in the margins of a nation's life, those whose children are most in need of that degree of protection against poverty which immunization can provide.

A third question mark over mass immunization asks whether such campaigns are merely a substitute for the more patient and less spectacular work of building comprehensive and permanent structures of primary health care.

In answer to these concerns, experience to date suggests that the cause of primary health care can in fact be significantly advanced through the involvement of health professionals in a major achievement for national development, through the pioneering of ways and means to bring a basic piece of health technology within reach of the majority, through the setting up of the necessary outreach structures, and through the involvement of the majority of the public in knowing more and doing more about their own and their families' health. It is for this reason that immunization programmes can serve both as an end and as a means of primary health care, achieving both immediate protection against specific diseases and the involvement of whole societies in the wider and longer-term cause of health promotion.

Such concerns deserve sustained attention. But after twenty years of vaccine availability, the denial of its protection to two-thirds of the developing world's children demands that something new must now be tried.

It would of course be preferable if there were enough fuel and roads and refrigerators and clinics and schools and health workers so that every parent knew all about immunization, lived within easy reach of permanent immunization services, received computerized reminders in the mail, and brought his or her children to be vaccinated at exactly the right time for each individual child. But that is to say nothing more than that it would be preferable if developing countries were not developing countries. And the sentence that *universal immunization must await economic development and the coming of a permanent health clinic to every village* is simply a sentence of unnecessary death and disability for many millions of today's children and for even more millions of those who are still to be born.

If immunization remains at today's levels then polio, to take just one example, will paralyse for life approximately 2.5 million children over the next ten years (Fig. 1). In addition to the personal suffering, the process of economic development itself will thereby be deprived of the contribution of most of those children and of most of those upon whom they become and remain dependent. When a cheap and simple technology to prevent polio is already in our hands, it is therefore neither humane nor economic to allow the disease to continue crippling over a quarter of a million children a year.

In the case of measles, the figures become unthinkable. At present levels of immunization coverage, a total of at least 20 million children are condemned to die over the next ten years from a disease which can be prevented by a single injection (Fig. 1).

Colombia: a child survival plan

Extracts from the speech delivered by President Belisario Betancur, on national television, on the launching of the Plan for Child Survival and Development in Colombia on 19 December 1984

We are proud to be the vanguard of programmes and actions recommended by UNICEF in its report on *The State of the World's Children* and by the World Health Organization in its plan for Health for All by the year 2000...

We have embarked on a significant change in our approach to health education and the promotion of new technologies. We have begun to mobilize all services and all sectors of the community behind actions such as the recent national vaccination campaign which, you will recall, has had an international echo.

Nevertheless, I know that we still need deeper and more aggressive action. Every year in Colombia, 60,000 children under five still die from eminently preventable causes. They die from diarrhoea, respiratory infections, problems during delivery, and malnutrition...

The most elementary human principles prevent us from allowing this situation to continue.

Therefore today we are committing ourselves before the entire world: we are committing ourselves to preventing, during the next five years, the deaths of 60,000 children every year. To achieve this, we are going to put all the resources of our nation, under the leadership of the Ministry of Health, behind a Plan for Child Survival.

This plan will be the most spectacular advance in Colombia's health for many years...

We are going to reach each house, each one of our 3.6 million children under five years of age.

We are going to reach them in order to work with them, and with their families, towards implementing simple actions of proven effectiveness in the protection of children's health.

We are going to distribute oral rehydration salts to all corners of Colombia so that no children die from diarrhoea.

We are going to keep immunizing our children until there are no more cases of vaccine-preventable diseasn.

We are going to give food supplements to our children, to babies under two, and to pregnant women in nutritional danger. And we are going to provide adequate treatment to children suffering from acute respiratory infections.

But above all we are going to make an even greater effort with all the mass media, with the participation of all of you, and of the entire community, to educate fathers and mothers so that they acquire simple knowledge and simple methods for guaranteeing the health and life of their children.

To do this, we will draw up plans involving all health personnel and young people... But we are also seeking the participation of the religious community, the military, the police, the Red Cross, the voluntary organizations, the trade unions, the community action boards, the co-operatives – in other words, everybody in our nation, with the invaluable support of the World Health Organization and UNICEF.

Let us recall that in dramatic and crucial moments in the history of mankind, many countries have called upon all the human resources of their nation, and especially their youth. Unfortunately, they have usually called upon them for the purposes of war. Today, Colombia has decided to call upon all the resources and capacities of our nation not to go to war, but on the contrary, to carry out the noble task of saving the lives of thousands and thousands of Colombian children.

There is no valid reason for further delay. And there is no pre-ordained reason why the developing nations should tread the same path to full immunization as was beaten by the industrialized world a generation ago. For like many of the other powerful low-cost basic health strategies available to the developing world today, immunization could become a contributing cause rather than an eventual consequence of economic growth and comprehensive health care. It is clear that there is a long-term connection between the mental and physical development of children and the social and economic development of their nations. And basic steps towards protecting the lives and health and normal growth of the young are therefore a slowly maturing but exceptionally high-yielding investment in economic development itself.

There are also shorter-term economic benefits. In the industrialized world, the immediate economic gains from immunization programmes have by now almost been forgotten. But to take the United States as an example, the present cost of vaccination programmes against three of the common infectious diseases comes out at $96 million a year. Without this programme, the cost to society of dealing with those three diseases (for hospital treatment and rehabilitation) would be at least $1,400 million a year – meaning that approximately $14 is saved for every $1 invested in the vaccination programme.[7] Similarly, the United States is now saving $500 million a year on measles treatment – for an outlay of only $50 million a year on preventing measles by immunization programmes.[8] According to Dr. William Foege, former Director of the United States Centers for Disease Control and now head of the international Task Force on Child Survival:* "*The return on such an investment in the developing world, where morbidity and mortality for measles are higher, would be even greater... a preliminary analysis of vaccine programmes in the Ivory Coast, for example, suggests the benefit to cost ratio may well exceed 20:1*".[9]

New technologies

So far, it has been convenient to discuss the technology of immunization and the strategies for making it more widely available as two separate components. In practice, of course, technological changes can have a significant effect on both supply and demand.

And today, vaccine technology has moved on to the point where a nation's ability to reach high levels of immunization coverage has become significantly *less* dependent on its level of overall economic development.

It has been commonplace for some years, for example, for two drops of oral polio vaccine to be administered by village health workers. But recent trials in Central and South America have shown that children can also be injected with vaccine – against DPT and measles – using disposable syringes in the hands of community volunteers with a few hours well-thought-out training (see panel 7). And as this report goes to press, trials are beginning in Guatemala with the 'Ezeject' system of vaccination in which both vaccine and needle come packed together in a single-shot disposable plastic syringe. As yet, there has been no complete evaluation of this method and the syringe-needle-vaccine package is not in commercial production.**

But in the last few years, more conventional kinds of disposable syringe have demonstrated their power to extend the outreach of immunization's arm in settings as different as Pakistan, El Salvador, Brazil, and the Dominican Republic.

* The Task Force for Child Survival was formed at a high-level meeting in Bellagio, Italy, in 1984, to assist selected countries in increasing and sustaining immunization coverage, to identify research needs in the field of immunization, and to mobilize resources for immunization programmes. The Task Force was established by, and reports to, five agencies concerned with child health: WHO, UNICEF, the World Bank, the United Nations Development Programme (UNDP), and the Rockefeller Foundation. The Bellagio group held its second major meeting, 'Bellagio II', at Cartagena, Colombia, in October 1985.

** Specific training is required to use the 'Ezeject' method of vaccination. An evaluation of the field trials now under way among a group of 2,000 children in Guatemala should be available by early 1986. Pioneering trials with the 'Ezeject' system were conducted in the United States and Costa Rica during 1976 and 1977, but there is a need for further field evaluation.

Burkina Faso: a vaccination commando

In one three-week period, starting on 25 November 1984, Burkina Faso has vaccinated over a million of its children against measles, yellow fever and meningitis. In the whole of 1981, the health services had immunized only 25,000 of the country's half a million children under two.

No expert would have considered Burkina Faso, formerly Upper Volta, a likely candidate for such an achievement. Desperately poor, beset by fifteen years of drought, it has one of the highest infant mortality rates in the world – 150 deaths per 1,000 live births. Less than half of the largely rural population lives within reach of a health centre. Over a third of young children are chronically malnourished, leaving them easy prey to the epidemics which sweep the country during the dry season from February to June. The death rate in meningitis outbreaks averages 11%. Measles causes half of all deaths of children between one and four, and in a bad year the tally can go as high as 43,000 cases.

These problems inspired the country's new government to 'Vaccination Commando' – a massive catch-up immunization drive designed to give the health services a respite from the epidemic season, and a breathing-space in which to plan for expanding their regular vaccination coverage.

To spur people's awareness of the value of immunization, Vaccination Commando tackled the diseases best known as killers in Burkina Faso. Vaccines were chosen that are both easy to give and require only one shot for full protection.

On 19 September the Council of Ministers set the date. The National Vaccination Committee, headed by the Director of Public Health, marshalled support from the ministries of education, information, agriculture and defence, and from the vaccination committees set up in every province, district, village and town. UNICEF, the Red Cross and other international agencies, together with other governments, notably China and the Republic of Korea, supplied technical assistance.

The Committees for the Defence of the Revolution (CDRs) – political volunteer groups active in every village, town and work-place – took on the most crucial task of all: mobilizing their communities.

As 25 November neared, CDR members went door to door explaining the benefits of vaccination to parents. They put up posters in schools, bars, and public places all over the country. Roadside billboards announced the campaign; plays about immunization were performed in the villages. The national radio service issued communiqués in all the local languages, urging attendance and broadcasting results as they came in.

When the vaccination posts opened up for business, they were besieged. In some villages the line of parents and children stretched for kilometres, patiently waiting through the day. Families came over the border from neighbouring countries, alerted by their relatives in Burkina Faso. Children came who were over age, under age, and already immunized. Many vaccination posts had to request extra vaccine because far more children turned up than expected: families have been on the move in Burkina Faso, as in all the countries of the drought-stricken Sahel.

The result: in a population of just under 7 million, 62% of children under fifteen are immunized against yellow fever and 64% against meningitis, while the number of under-sixes protected against measles has leapt from 7% to 60%.

Whether this level of coverage can be sustained in the face of all the country's difficulties remains to be seen. But Vaccination Commando has made an impressive beginning. The alliances have been forged to make children's health the concern of everyone. Parents are more aware of what their children gain from vaccination. And Burkina Faso has drawn up plans for introducing primary health care to all its 30 provinces, and immunizing all its under-fives by 1990.

In particular, the use of disposable syringes in the hands of community volunteers on certain set days or weeks of the year is opening up broad new paths to the immunization of all children:-

- Because the syringe is disposed of rather than sterilized for reuse, vaccination programmes can be freed from the weight of time and energy required to boil syringes for 20 minutes before reuse (at the same time as reducing the possibility of disease transmission via multiple use of the same needle).

- Because community volunteers can be taught to use the syringe, immunization programmes can escape from the strait-jacket of the doctor's white coat (fully qualified doctors can play a supervisory role in such programmes, rather than being personally involved in giving each and every injection).

- Because village vaccinators receive supplies on just two occasions a year and use them within days of their arrival, immunization programmes could be cut free from the cold chains of refrigeration.

- And because this method could be used to immunize such a high proportion of children all at one time, it might mean that the transmission of the infectious diseases was so severely interrupted that a degree of protection would be provided even to those who were not reached by the vaccination itself.

Technological developments of this kind are therefore making it more possible for other organized sections of society, far greater in their outreach than the health services themselves, to become involved in extending immunization to all a nation's children.

But making universal immunization possible by no means makes it inevitable. And to convert this new potential for universal immunization into the actual vaccination of all children, an act of galvanizing political will – by a nation's leaders – is the catalyst which is so desperately needed. As the Secretary-General said this September (1985) in his report to the General Assembly on the occasion of the fortieth anniversary of the United Nations:-

"*The great endeavour to bring immunization to all children in the world by 1990 now seems capable of realization if there is a will to make the final effort.*"

In the last year and a half, some outstanding examples of that 'will' have been seen in several nations of the developing world. They have been examples set by heads of state and government ministries, by health service administrators and primary health care workers, by doctors and nurses, by local government officials and civil servants, by the women's organizations and the youth movements, by the representatives of international agencies and of voluntary organizations, by journalists and broadcasters, by priests and imams, by teachers and students, by the Red Cross and the Rotarians, by the private sector and the trade unions, and by many millions of parents.

In most if not all cases, the mobilization of a society's resources on such a scale and behind such a cause has been made possible by the decision of a nation's political leaders to put their own personal and political commitment, and their government's financial and organizational resources, behind the effort to immunize the vast majority of the nation's children. In El Salvador and the Dominican Republic, in Colombia and Brazil, in Turkey and Sri Lanka, in Burkina Faso and the Sudan, success so far has been made possible by a nation's leadership deciding on a goal which it could see was both dramatically important and realistically achievable.

The industrialized world

In the industrialized world, the commitment to world-wide immunization has so far, and with a few honourable exceptions, been modest. An exception large enough to demand acknowledgement is the $100 million allocated this year by the government of Italy as a special contribution towards "*saving the lives of one million children*".[10]

Overall, the developing countries themselves are providing over 80% of the resources for their vaccination programmes.[11]

Meanwhile the total amount of aid being provided by the governments of the industrialized nations for all health services in the developing

Dominican Republic: reaching every home

The greatest single threat to hopes of achieving a revolution in child health is the difficulty of reaching the very poorest of the developing world's children.

The difficulty stems from the fact that poorer people have less information and confidence, less status and access, and less time and money. And what makes it doubly important is the fact that health problems such as diarrhoeal disease or measles are both more common and more severe among the poorer sections of any society.

This fundamental problem gives special significance to what is now being achieved – and planned – in the Dominican Republic.

Other countries have attempted to immunize greater numbers of the poor by setting up temporary immunization posts closer to people's homes. But the Dominican Republic is going all the way – carrying vaccination right into the home of every single family.

In 1983, the Ministry of Health's new system went into action for the first time as 20,000 volunteers gave oral polio vaccine to children under five. One of those 'volunteers' was the President of the Dominican Republic – who set the example by himself immunizing 27 children in his own neighbourhood. Some 95% of the nation's children have been fully protected against polio ever since, and no new cases have been reported for over two years.

Following the Health Minister's step-by-step plan, the system went into action again in October 1985 – this time to take on the more difficult task of vaccinating all the nation's children against measles. In many nations, only qualified doctors or nurses are allowed to use syringes and needles to give injections. But in the Dominican Republic, pioneering methods have reduced the training to only four well-thought-out hours. An audio-visual teaching package – field tested, revised, and tested again by the Ministry of Health – conveys the exact information a volunteer needs to inject a child safely against measles. This rigid training course has been followed by all 20,000 volunteers, working in small groups under the supervision of specially trained personnel. During the training, volunteers practised actual immunization by giving each other an injection of vitamin B12. During the campaign itself, disposable syringes were used to obviate the difficulties of sterilizing equipment.

At the end of 1985 the volunteer force is due to immunize all women of child-bearing age against tetanus, so also protecting the new-born babies of the future. At the same time, all children under two are due to be given the first of the three injections against diphtheria, whooping cough, and tetanus.

Provided the current schedules are met, the Dominican Republic will have immunized the vast majority of its under-fives against the main killer diseases of childhood by mid-1986 – three and a half years ahead of the international target date.

By instituting national vaccination days (with vaccines sent out just in advance from a central cold storage depot), the programme has solved the problem of maintaining year-round refrigeration at every health clinic. By training thousands of volunteers, the programme has solved the problem of not having enough doctors or paramedics. By visiting every home, the programme has solved the problem of reaching the poorest. By building the staff and funding for national vaccination days into the Ministry of Health's own budget (including provision for the regular training of replacement volunteers), the programme has tackled the problem of sustainability.

To support these efforts, the government in August 1985 launched a National Programme for Mothers and Children, with the emphasis on improving their well-being in poor rural and slum areas. The plans include family planning services, pre-natal care and midwife training, along with advice on breast-feeding, growth monitoring, and oral rehydration to forestall diarrhoeal dehydration.

world is only about $4,000 million a year[12] – the equivalent of about two days' military spending (Fig. 19). And of that $4 billion, only about 20% goes to all mother and child health services, including immunization.[13]

By contrast, many private groups in the industrialized nations are heavily and generously involved in contributing towards the goal of immunization for all children by 1990. To mention another particularly outstanding example, the one million members of Rotary International have committed themselves to paying for all the vaccine required in any polio campaign in any developing country over the five years from now until the year 1990. The total cost of Rotary International's 'Polio 1990' campaign could be in the region of $120 million; the total benefit could be the prevention of more than 1 million cases of paralytic poliomyelitis.[14] In many industrialized countries, national committees for UNICEF and other non-governmental organizations are also working to help raise funds – and awareness – to support the goal of immunization for all the world's children by 1990.

There are perhaps two main reasons why the governments of the industrialized world might wish to consider a much greater level of support in order to help realize this new potential for universal immunization.

The first, and most important, is that the immunization of all children remains one of the greatest of all humanitarian goals.

The second is that it would also result in very significant economic gains for the industrialized nations themselves.

Evidence for this is to be found in the annals of the international campaign to eradicate smallpox:-

In 1967, smallpox killed an estimated 2 million people. In 1977, the last case of smallpox was recorded in Somalia. The cost of the eradication campaign was approximately $24 million a year, of which about one-third came from the industrialized nations and two-thirds came from the developing countries themselves.[15] For the duration of the programme, the United States contributed a total of $32 million (in 1970 dollars).[16] Since then, the United States government has been able to discontinue smallpox vaccination and dismantle its elaborate quarantine and surveillance systems – which were costing approximately $120 million a year in today's terms.[17] In other words, the eradication of a major disease has meant that the United States is now saving *every few months* more than the total amount it invested in the eradication programme itself.

As we have already mentioned, the United States is today spending approximately $50 million a year on vaccination and routine surveillance against measles and will continue to do so for as long as measles is at large in the world. A successful eradication programme would therefore save the United States $50 million a year – every year from now on.

The humanitarian case for immunizing all children is beyond all question. The technology for immunizing all children is readily available. The cost of immunizing all children would be repaid many times over for both industrialized and developing nations. And the all-important organizational and communications capacity for reaching out to create and meet the demand for immunizing all children, has been shown to be within the power of those nations with the will and commitment to do it.

In the process, important strides could be made towards primary health care for all and new ways could be opened up for putting other pieces of vital health knowledge and other low-cost technologies at the disposal of the majority of the people.

The next chapter of this report discusses some of those other low-cost techniques and looks at what can be learned from experiences so far in the attempt to put them at the disposal of the majority. And as with immunization, the solution does not rest solely in the techniques themselves, but rather resides in the will and the capacity of nations – and their leaders – for reaching out to inform and support parents in using those techniques to take more control over their own and their families' health.

If that can be achieved, and if in the process health care can come to be seen not only as passive recipience of services when sick but as active and

informed involvement in the daily process of staying well, then the technologies and the knowledge now available are cheap enough and manageable enough for parents themselves to bring about a revolution in child health and cut by at least half the rate of malnutrition, infection, and death among the children of the developing world.

Reaching all children

Parents cannot make their own vaccines. But there is a product which parents can make, which they can give to their own children, and which is just as important for protecting their lives and their health.

That product is oral rehydration solution. It can be made with one of the 200 million sachets of oral rehydration salts which were mass-produced in the developing world last year (Fig. 6). Or it can be made at home using either salt and sugar solutions or traditional remedies such as rice conjees or carrot soups.[1] Either way, such a solution can effectively prevent or treat the diarrhoeal dehydration which is still killing approximately 4 million children each year.*

The technical details of ORT are set out in Part II of this report (see Lifelines: ORT). But such a breakthrough bears restating in all its simplicity:-

There is now an incredibly cheap, simple, safe, and effective method by which parents themselves, however poor, can protect the lives and growth of their children against one of the most common causes of child malnutrition and child death in the modern world.

At present, only about 20% of the world's families know enough about ORT to be able to use it. But it is already estimated to be saving the lives of more than half a million children a year.

Together with rising immunization coverage, the spread of ORT therefore holds out the promise of a drastic reduction in child deaths and child malnutrition over the next few years. But as with immunization, realizing this enormous potential now depends not on the scientific breakthrough itself but on finding the equivalent 'social breakthrough' which can put ORT at the disposal of many millions of parents.**

* In the first instance, ORT means continuing to give a child food and fluids during any episode of diarrhoea. To replace the essential fluids and salts, oral rehydration solutions can be administered by the parents in the child's own home - using either a 10 cent sachet of oral rehydration salts; or a home-made solution of salt, sugar (or rice powder), and water (in the right proportions); or a version of one of the effective traditional remedies such as rice conjees or carrot soups. Approximately 10% of all cases will need more specialized treatment (such as the sachet of WHO/UNICEF formula oral rehydration salts, or even intravenous therapy). But in all cases, the risk and severity of dehydration is reduced, and the effectiveness of more specialized treatments is increased, by the early administration of oral rehydration in the home.

** The United States Agency for International Development (USAID), under its Administrator Peter McPherson, has made a major commitment to the promotion of oral rehydration therapy in the developing world and is contributing substantially to several of the major ORT programmes mentioned in this year's report (see panel 9). The UNDP has also played a significant role in the development and refinement of oral rehydration therapy, through its long-term support of the International Centre for Diarrhoeal Disease Research in Bangladesh (ICDDR,B), through its programmes of which ORT promotion is now a part, and through its co-sponsorship (with WHO, UNICEF and USAID) of the International Conferences on Oral Rehydration Therapy. The second Conference is convening in Washington D.C. as this report goes to press and will again bring together, from many different nations, experts and practitioners who are directly involved in the task of promoting ORT. Another United Nations agency, the Fund for Population Activities (UNFPA) has also made an important contribution to the work of the ICDDR,B and, in particular, has funded research which has demonstrated that reductions in child deaths through simple measures like ORT, when linked to effective family planning programmes, lead to both improved survival rates and a decline in population growth (see panel 25).

Basic protection and vitamin A

ORT and immunization therefore stand in the front line of a revolution in child survival. But they do not stand alone.

Over the last three years, the *State of the World's Children* report has brought together research and experience from around the world to show that several such basic breakthroughs have now been made. Taken together, they could enable most parents in poor communities to protect the lives and normal growth of their children.

Specifically, previous years' reports have demonstrated that knowledge about breast-feeding, improved weaning, and regular monitoring of children's growth could, along with immunization and ORT, save the lives of at least half the 40,000 children who are now dying each day in the developing world.

It has been found, for example, that babies in poor communities who are bottle-fed are two or three times more likely to die in infancy than babies who are breast-fed (Fig. 12). Reversing the trend towards the use of artificial infant formulas (Fig. 7) could therefore save the lives — and protect the normal growth – of hundreds of thousands of infants in the developing world (see panel 23 and Lifelines: breast-feeding).

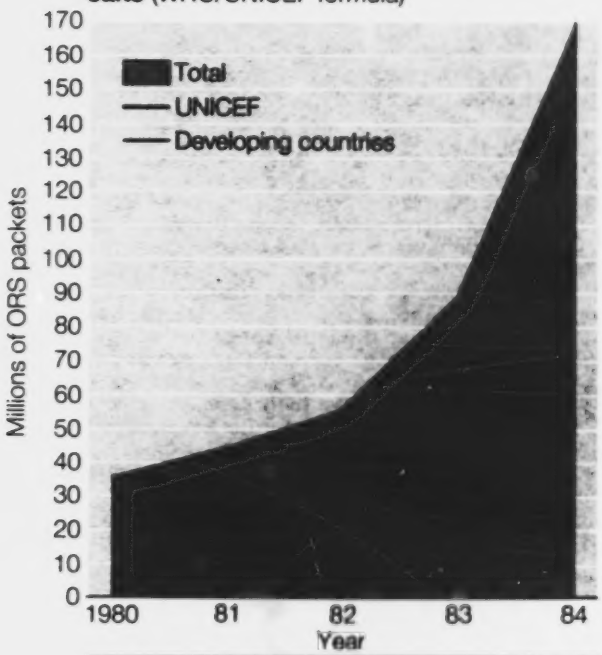
It is also now thought that regular growth checking, along with changes in the timing and method of weaning, could reduce by half the incidence and severity of malnutrition among the poor world's children (see Lifelines: growth monitoring).

This year, another potential breakthrough must be added to the list. The findings from a major child health study in Indonesia appear to have confirmed a long-held suspicion that a lack of vitamin A in the child's diet, long known to be a cause of xerophthalmia (drying of the eyes) and eventual blindness, is also an important determinant of a child's overall health. Page 22 illustrates the remarkable finding that the incidence of both respiratory and diarrhoeal infections (the two most common causes of illness and death among children of the developing world) is closely associated with the degree of vitamin A deficiency.[2]

At first, it was believed that this association could be explained by the idea that the lack of vitamin A was probably only an indicator of the more general malnutrition which is well known to predispose a child to illness. But further analysis has suggested that otherwise well-nourished children who lack vitamin A are more prone to both diarrhoeal and respiratory illnesses than are poorly nourished children who happen to have adequate levels of vitamin A.[3]

In the one major test of the practical significance of these findings, it appears that distribution of the standard UNICEF vitamin A capsule every six months has succeeded in reducing child death rates (in the age group one to three years) by approximately 30% among a population of over 15,000 children in Indonesia.[4]

Fig. 6 Global supply of oral rehydration salts (WHO/UNICEF formula)



Note : Figures exclude commercial production. In addition to the above figures, an estimated 10 million packets are supplied by other international and bilateral aid agencies.

Source : UNICEF

THE VITAMIN A STORY

Although it has long been known that approximately 250,000 children are blinded every year by xerophthalmia brought on by severe vitamin A deficiency, only one large-scale field study in recent years has looked at the relationship between the lack of vitamin A and overall child health. For an 18 month period, 4,000 Indonesian children, aged 1 to 5, were given health checks every three months. Health records from a total of over 20,000 three-month 'child intervals' were therefore assembled. The differences in the health records of children with and without vitamin A deficiency (as measured by the degree and kind of eyesight problems) were then analysed. The results are shown in chart A.

As the chart shows, the child death rate almost triples with each increase in the degree of vitamin A deficiency.

The records were then re-examined to try to analyse *why* death rates were so much higher among those with vitamin A deficiency. As an obvious starting point, the study looked at the incidence of diarrhoeal disease and respiratory infections – two of the main causes of child deaths in the developing world. The findings are presented in chart B.

Again, the chart shows that children with vitamin A deficiency are many times more likely to contract diarrhoeal disease and respiratory infections.

But there is an obvious doubt to be raised about these findings. Is vitamin A deficiency an important factor in its own right? Or just an indicator of the more general malnutrition which is well-known to be associated with higher rates of child illness?

To find out, the records of the children in the study were divided into two groups – those who were adequately nourished and those who were undernourished. The differences can be seen in chart C.

Generally malnourished children were indeed more prone to infection than those who were adequately nourished. But as chart C shows, *a generally well-nourished child with vitamin A deficiency is at greater risk of infection than is a generally malnourished child without vitamin A deficiency – suggesting that the level of vitamin A is a more important determinant of risk to the child than is the child's overall nutritional status.*

The next step was to try to find out whether these findings could be put to practical use – in other words would the distribution of vitamin A capsules to children result in significantly fewer illnesses and deaths?

Choosing an area where the government of Indonesia was steadily expanding its vitamin A distribution, a new study was launched to look at the health of 30,000 children, half of whom were already receiving the standard UNICEF Vitamin A capsule once every six months and half of whom had not yet been reached by any extra vitamin A supplement. Chart D shows the results.

All children were examined at the beginning of the study and then again one year later (after those receiving supplements had received two doses of vitamin A).

As chart D shows, the distribution of vitamin A reduced overall child death rates by over one-third among children over the age of one year.

The overall conclusions of this study have been summed up by its principal investigator, Dr. Alfred Sommer:-

"The significance of these findings is obvious, at least for countries like Indonesia. We know that five to ten million children develop mild xerophthalmia, hence vitamin A deficiency, every year. Given these figures, and the increased risk of death among children with mild, and probably even with subclinical vitamin A deficiency, it may account for as much as 20-30% of all preschool-age deaths in developing countries."*

"... Increasing vitamin A intake may therefore be the most practical effective means for improving child survival in the developing world."

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* "As striking as these results are, they may, in fact, underestimate the potential impact of vitamin A supplementation in this population. The highest risk groups, children with xerophthalmia at the baseline examination, were treated and dropped from the study; coverage was extremely high because a special mechanism was in place, but was still considerably less than 100%. Data suggests those who needed the vitamin A capsule were the least likely to have received it. Therefore universal coverage might have produced an even greater impact. This area did not have an excessive rate of vitamin A deficiency, one barely meeting the WHO criteria for a significant public health problem, and therefore the impact should not be greater than would be expected in most developing countries with vitamin A deficiency. The control group was not purely isolated: children with xerophthalmia who presented to the clinic received treatment, and an outreach program provided vitamin A to neighbours because of the known clustering effect of vitamin A deficiency. If there had not been such an outreach program, the difference in mortality rates might have been even greater. Finally, we do not yet know the duration of protection provided by a single 200,000 IU capsule. While we assume it will prevent blindness for a six month period, blood studies suggest it only maintains vitamin A levels within the normal range for 8 to 12 weeks. Further analysis of the data may indicate that most of the impact occurred after vitamin A supplementation, with a waning of the impact, as vitamin A levels fall, over time."

Chart A Mortality rates in relation to eyesight status, (indicator of vitamin A status)

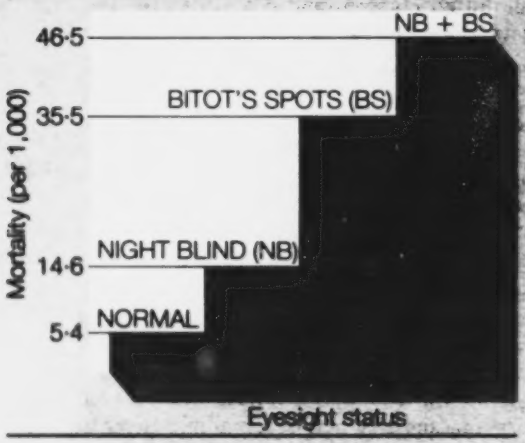
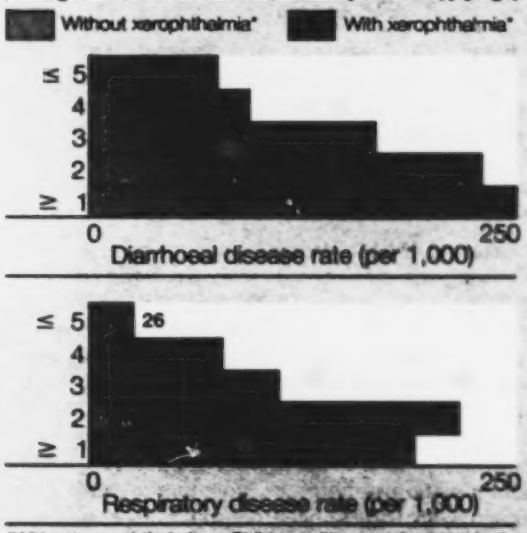


Chart B Incidence of diarrhoeal and respiratory disease among children with and without xerophthalmia, (by age)



*Without xerophthalmia = Children with normal eyes at both the start and end of the 3 month observational interval. With xerophthalmia = Children with mild xerophthalmia (night blindness and/or Bitot's spots) at both the start and end of the interval.

Chart C Incidence of diarrhoeal and respiratory disease among adequately nourished and undernourished children with and without xerophthalmia, (by age)

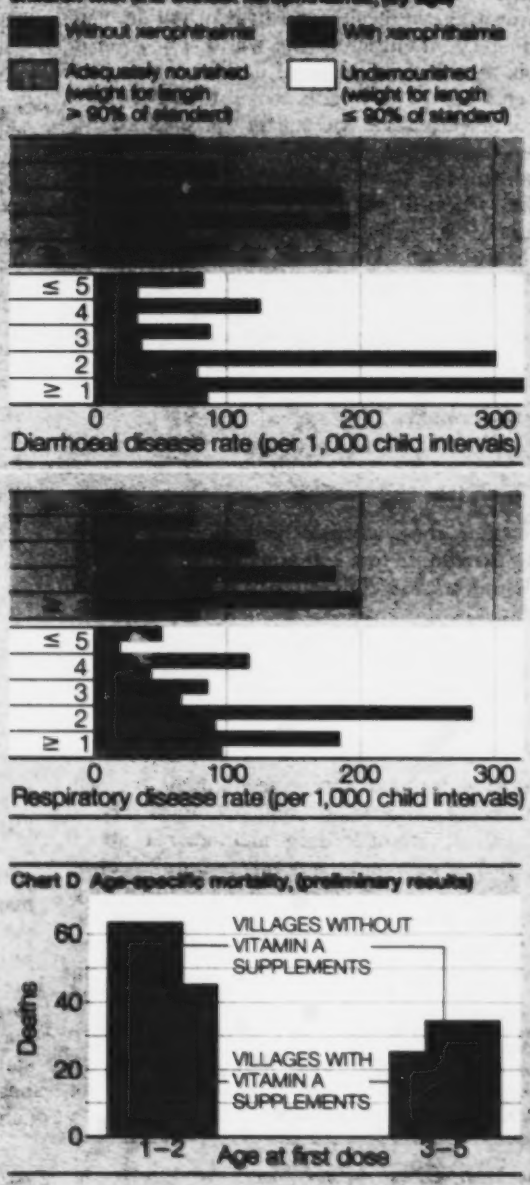


Chart D Age-specific mortality, (preliminary results)

Should these findings be confirmed, then the maintenance of an adequate level of vitamin A will join the range of low-cost, parent-based ways of protecting the health and lives of children in the poor communities of the world. For even if the six-monthly capsules are not available (and they cost only 2 or 3 cents each), then adequate vitamin A levels can be cheaply maintained by parents themselves – *if* they are empowered with the knowledge that vitamin A is vital for their children's health and if they know that it can be provided by the dark-green leafy vegetables which are among the commonest and cheapest foods in almost all regions of the developing world.* Or as the Executive Director of Helen Keller International has expressed it: "*vitamin A is a simple, low-cost intervention that can save the sight and the lives of millions of the world's most vulnerable children*".**[5]

Action on the 'children's revolution'

Together, these advances in basic child health protection add up to a potential revolution for the developing world's children. And it is a revolution which could serve as a starting-point for building up more comprehensive basic health systems and so help to promote the kind of healthier, more productive, and more confident communities which are the power and the purpose behind the progress of development itself.

But as with immunization technology, the real potential of knowledge breakthroughs about ORT, about infant-feeding methods, or about vitamin A levels, resides not only in the efficacy of the techniques themselves but in the fact that they can be put into practice by parents. Most of the new techniques are cheap and simple enough to become part of a mother's normal way of bringing up and caring for her children. And this means that the benefits of this knowledge could be made available to all children and not just to the few who have access to sophisticated medical facilities.

But by the same token, the challenge of the child survival revolution has now become the challenge of finding ways and means to mobilize much more far-reaching forces than just the health facilities in order to reach out to inform and support the vast majority of parents in using this new knowledge to bring that revolution about.

This year, several nations have mobilized their societies to double and treble the percentage of children who are reached by immunization services. But some nations have also been demonstrating that the strategy of mobilizing all possible organizations and channels of communication can also be used to put other low-cost methods of child protection at the disposal of the majority of all parents. Some examples:-

The Americas

In Brazil, child survival and development programmes are being launched not only by the Ministry of Health but by three different government ministries in co-operation with the Catholic Church, the mass media, the Brazilian Assistance League, and the 18,000-strong Brazilian Association of Paediatricians.

To promote breast-feeding, and to reverse Brazil's long-standing trend towards artificial infant formulas, more than 50,000 health workers have been trained to inform and support mothers with present knowledge. At the same time, the mass media have devoted $1 million in air-time to the task of promoting the facts to the general public. In the state medical colleges, the value of breast-feeding is now a compulsory subject. And in all state maternity hospitals, 'rooming-in' and encouraging breast-feeding from birth is now standard practice.[6] Internationally, the UNFPA has allocated $15 million in support of this campaign.

Growth monitoring is also being adopted as standard practice in all maternal and child health clinics and a new Brazilian growth chart is now being tested.

* Other vegetables, such as carrots, and fruits such as papaya and mango, also contain the carotene from which the body can derive significant quantities of vitamin A.

** Among the earliest responses to the new finding is the announcement by the USAID that it will make available a total of $8 million for vitamin A programmes over the next three years.

Oral rehydration therapy, backed by the free distribution of over 10 million sachets a year, has now spread to the point where at least 5 million cases of diarrhoeal illness in Brazilian children have been treated with the new therapy in the last twelve months.

To increase the outreach of the child survival campaign in the desperately poor north-east, the National Council of Brazilian Bishops has decided that its 'Pastorate of the Child' programme will reach 1 million of the poorest children by the end of 1985. Pilot campaigns in the southern town of Florestopolis – including immunization, growth monitoring, oral rehydration therapy, and child spacing – have sharply reduced infant and child deaths and the programme is now being extended to 20 other cities.[7] In all, the outreach capacity of Brazil's Catholic Church includes not only its 5,000 parish priests but 14,000 health workers, 1,200 Catholic hospitals, 120 Catholic radio stations, 23 newspapers, 35 magazines, a major publishing house, and over 3,000 bulletins and newsletters. "*This formidable potential," reports UNICEF's office in Brasilia, "is now being mobilized in order to bring child survival strategies to the north-east*" (see panel 10).

In Central America, UNICEF and the Pan American Health Organization have this year signed an agreement to support national child survival plans in Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. All of the region's governments plan to 'go national' with ORT and to push their immunization rates above the 80% mark before 1990 as part of an effort to halve the region's infant mortality rate and save the lives of approximately 90,000 children each year.

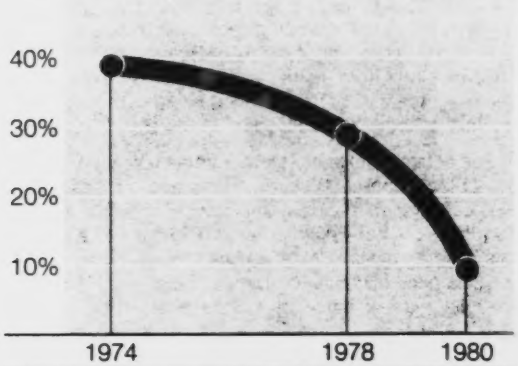
In Nicaragua, UNICEF has agreed to provide 1.5 million sachets of oral rehydration salts per year – for distribution through the country's tens of thousands of *brigadistas* (health volunteers) as well as through commercial pharmacies, corner shops, market-traders, and the 356 oral rehydration units which have been set up across the country over the last three years. At the moment, an estimated 58% of all cases of childhood diarrhoea in Nicaragua are being treated with ORT. Other child protection strategies are now being put at parents' disposal via the three People's Health Days which mobilize 20,000 volunteers each year. Since 1982, for example, not a single case of polio has been reported (panel 12).

In Haiti, over 80% of parents in the slums of Port-au-Prince – and 30% in the rural areas – have now begun to use ORT. Sachets of the salts have been distributed through thousands of small commercial outlets and demand has been created by promoting the ORT idea through newspaper and radio advertisements. To reinforce the impersonal message of the media, one day's training in ORT has been given to all organized groups who are in regular contact with a wide public – the schoolteachers, the health workers, the agricultural extension workers, the traditional healers, and over 15,000 members of the Boy Scouts (panel 19).

In Colombia, the President has announced a National Plan for Child Survival and Development "*to prevent the deaths of 60,000 children every year*". Backing up the professional health services, the plan will involve the Catholic Church, the mass media, the Red Cross, the voluntary organizations, the co-operatives, the police, the army, and some of the 120,000 community volunteers who have been involved in the recent immunization campaigns. "*We are going to reach each house, each one of our 3.6 million children under five years*

Fig. 7 Decline in breast-feeding, São Paulo, Brazil, 1974–1980

Percentage of infants breast-fed for six months or more.



Source: International Union of Nutrition Scientists, Ad Hoc Task Force on Rethinking Infant Nutrition Policies, March, 1982.

Bolivia: reducing child deaths

8

Despite considerable economic difficulties, the government of Bolivia has been carrying out a programme to reduce its infant death rates by 50% over the next five years, using low-cost techniques such as expanded immunization and oral rehydration therapy.

The problem was clearly too big for the health services to tackle alone. The regular immunization programme, for example, was reaching less than a quarter of Bolivia's children, despite being theoretically available to all. So in February 1983 the Minister of Health decided to enlist the help of the country's other organized resources – the schools, the churches, the mass media, the workers' unions and the farmers' unions – in order to reach more families and support them in improving their own and their children's health. 'People's health committees', each headed by a volunteer 'people's health representative', were set up throughout Bolivia.

The first test came with the anti-polio campaign of late 1983 and early 1984. Every possible resource was employed to increase the availability of immunization and to inform parents of its importance. The result was that three shots of oral polio vaccine reached 70% of children in Bolivia's rural areas and 90% of the children in towns and cities.

A few months later, on 8 April 1984, the machinery went into action again to immunize the nation's children against measles – and again, over half a million children were vaccinated.

In 1985 a similar assault was launched on diphtheria, pertussis (whooping cough) and tetanus, using DPT 'triple vaccine'. Newspapers, television stations and some 80 radio stations alerted parents to the coming vaccination days. The people's health representatives visited every house to inform all parents that vaccination was available and essential. In the city of Santa Cruz, a special message from the Bishop, urging parents to take their children to be immunized, was read out in every church of the city during Sunday mass.

Two days before the launch date of 10 March, Bolivia's national trade union called a general strike; 10,000 demonstrators poured into the capital, La Paz, and road-blocks went up on main highways throughout the country. But with the union's support, the vaccination campaign went ahead unhindered. In total, 15,000 health workers, mostly volunteers, manned 5,000 vaccination posts and vaccinated 215,237 children – 85% of Bolivia's children under three. In previous years, triple vaccine had reached only 10% of under-threes.

Another major killer of Bolivia's children – diarrhoeal dehydration – is being tackled by setting up oral rehydration units, both to supply oral rehydration salts and to teach parents when and how to use them to forestall dehydration. So far 5,000 units, most of them managed by the people's health representatives, have been established. To create the demand and to teach the public how to use the units, all possible communication channels have been used – from church services to radio and television 'advertisements', from street dramas to wall murals.

In a further move to safeguard children's well-being, all state maternity hospitals have adopted the policy of 'rooming-in' new-born babies with their mothers to encourage breast-feeding. The government is also iodizing table salt to counter iodine deficiency, since 65% of Bolivian schoolchildren suffer from goitre. And messages on child survival are now part of the curriculum of rural primary schools and colleges.

The Ministry of Health's programme has already saved thousands of children's lives and put basic elements of health care at the disposal of three or four times as many children as in previous years. If this programme can be sustained, it will bring a revolution in child survival to the country which still has the highest infant and child death rates in South America.

of age," said President Betancur at the launching of the campaign; "*and we are going to work with all families towards implementing simple actions of proven effectiveness in the protection of children's health*" (see panel 5).

In Honduras, deaths from diarrhoeal dehydration are reported to be falling after a one-year campaign to market ORT via television and radio. With mass-media messages backed up by 1,200 health workers making home visits, over 90% of Honduran women now know about the new remedy for diarrhoeal illness and almost 50% have begun using Litrosol – the local brand name for oral rehydration salts.

In Ecuador, a national plan has been launched to put four of the most basic strategies of child survival (growth checking, oral rehydration therapy, breast-feeding and improved weaning, and immunization) into practice on a national scale. The Ministries of Education, Defence, and Social Welfare, as well as the Ministry of Health, are involved and the plan is being supported by the mass media, the National Association of Medical Schools, and the National Council of Bishops. The same basic child health strategies are being introduced into the curriculum of all primary and secondary schools and volunteer university students are taking a house-to-house inventory of all young children in preparation for the national vaccination programme.

In Venezuela, 600,000 children are now receiving growth monitoring charts which also carry advice on breast-feeding, immunization, and ORT.

In Bolivia, where over 100,000 children have been dying each year from diarrhoeal dehydration, over 5,000 oral rehydration units have now been set up – 70% of them community-based – and over 2 million sachets of oral rehydration salts have been distributed. To promote breast-feeding, state maternity hospitals have changed to policies of 'rooming-in', television and radio are making the facts known to the public, and a national code is being drawn up to prevent the marketing of artificial infant formulas direct to the public (see panel 23). In support of these policies, the basic messages of the 'child survival and development revolution' have been introduced into the 'health and home-making' curriculum of all the country's rural primary schools (see panel 8).

Asia

In India, where the Prime Minister's commitment has opened the way for a nation-wide campaign to immunize all children over the next five years, other child protection strategies are already going into action via the Integrated Child Development Services (ICDS) and the Urban Basic Services schemes – huge outreach projects, which, in the case of the ICDS alone, are now providing basic care to 10 million of India's poorest children.

In some areas, the results of the ICDS are already evident in lower rates of malnutrition, falling rates of low birth-weight, higher levels of immunization coverage, and fewer child deaths. Sample studies in 15 states have shown that 85% of malnourished children gain weight through the ICDS scheme and the Chairman of the ICDS Technical Committee estimates that almost 100,000 children's lives have already been saved.[8] The primary participants in the ICDS are the poor. And over the next five years, the scheme is scheduled to reach 60% of the children living in India's poor communities.

Broadening the base of this progress, India's massive drinking water programmes have now reached more than 200,000 villages and are beginning to have an effect on reducing infection.

In Bangladesh, the government's own National Oral Rehydration Programme is distributing over 17 million sachets of oral rehydration salts each year and the mass media are helping to create the demand by carrying the ORT message into millions of homes.

Meanwhile the Bangladesh Rural Advancement Committee (a non-governmental organization) has trained and fielded almost 1,000 ORT workers who have so far visited over 5 million mothers and 15,800 schools to give practical demonstrations of why, when and how to use

Egypt: leading the world on ORT

Egypt has passed the half-way point in its five-year campaign to promote oral rehydration therapy (ORT) and save the lives of the 80,000 and more children who now die each year from diarrhoeal dehydration. Results so far show that child death rates have been cut by approximately 30% in the test governorate of Alexandria.

Using what was learned in Alexandria, the project is now going nation-wide. As of mid-1985, over 4,000 clinics throughout Egypt have started oral rehydration centres to administer ORT and to teach mothers how to use the new therapy. Ahead of schedule, the programme is already beginning to have an impact on the infant death rate nation-wide. "*By the end of this project,*" says a member of the campaign team in Cairo, "*we fully expect to achieve a 25% reduction in overall mortality among Egyptian children.*"

For ten years, ORT has been an officially recommended treatment in Egypt. But the salts were only available on prescription and there was little promotion to the public. So probably fewer than 1% of Egyptian parents were using the cheap life-saving breakthrough which could enable them to fight the single biggest threat to their children's lives and health.

But in January 1983, after six years of careful preparatory work and trials, the Egyptian government became one of the first in the world to pick up the ORT weapon on a national scale and declare war on the disease which is responsible for half of all child deaths in Egypt. With the help of a grant of $26 million from the United States Agency for International Development, the Ministry of Health launched the National Diarrhoeal Disease Control Programme under a high-powered secretariat with a total budget of more than $50 million.

Specially arranged lectures, workshops, articles in medical journals, and courses at a dozen universities – plus the setting up of over 100 ORT training units – educated large numbers of Egyptian doctors and nurses about the new treatment. To capture the next generation of health professionals, ORT courses have been introduced onto the curricula of all medical colleges, teaching hospitals, and nursing schools.

The larger goal is to enable mothers themselves to prevent dehydration and to protect the child's nutritional health by the early use of ORT, by continuing to give plenty of food and fluids, and especially by continuing breast-feeding, during episodes of diarrhoea. In the Alexandria trials, television commercials for ORT had been broadcast every night for a month at peak viewing times. By the end of the month, most mothers knew about ORT and 36% had already begun using it. Now the television campaign is being broadcast nationally and the ORT symbol is reported to be the most widely recognized advertisement in Egypt.

To meet the demand, all pharmacists stock sachets of ORT. A 30% profit margin for the shopkeeper – plus free ORT measuring cups which can be sold to customers – is helping to compensate for profits lost on sales of anti-diarrhoeal drugs (which are more expensive and in most cases totally ineffective). National production of the sachets themselves is now running at 80 million a year.

When the National Diarrhoeal Disease Control Programme comes to an end in 1987, ORT should be a normal part of the nation's health system and of the people's own health behaviour. In the meantime, President Mubarak has announced his government's intention to seize the next great opportunity for protecting the lives and the growth of the nation's children – accelerating the country's immunization programme against the infectious diseases which now kill more than 50,000 Egyptian children each year and leave a similar number disabled. The target will be met before 1990 and, if at all possible, by September 1987 – the thirty-fifth anniversary of the Egyptian revolution.

home-made oral rehydration solutions (see panel 16). In Dhaka, the 1,000 urban volunteers who distribute 4,000 sachets of oral rehydration salts each week are also now distributing vitamin A capsules and bringing present knowledge on diarrhoeal disease control and improved weaning and feeding methods to the poorest areas of the city.

In Thailand, more than half of the nation's 3.3 million under-threes are now regularly growth-checked and more than half of the nation's parents have begun to use ORT to treat diarrhoeal illness (see panel 21).

In Indonesia, child survival strategies are being introduced, via the Family Nutrition Improvement Programme, into two-thirds of the country's 67,000 villages. A few days' training has been given to 400,000 volunteer nutrition *kaders* who are now able to advise parents on basic health and infant feeding and refer more difficult cases to one of over 5,000 clinics. By 1990, the aim is to involve virtually all Indonesian mothers in the regular checking of their children's growth (panel 13).

In the Philippines, approximately 70% of mothers now know about ORT and an estimated 25% have begun using the new therapy.

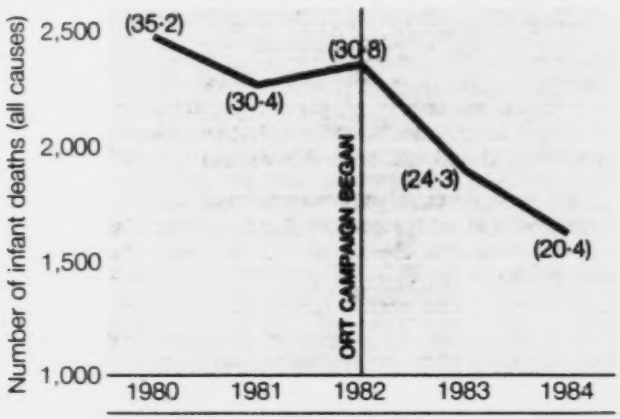
In Pakistan, 1,300 doctors and 4,500 paramedics have been trained in ORT and an annual supply of 22 million sachets of oral rehydration salts is being promoted to the public via television, newspapers, posters, meetings of community leaders, and by the training of 5,000 traditional birth attendants each year (see panel 11).

In Kabul, Afghanistan, a campaign has already begun to halve the city's infant mortality rate by 1990 through basic child survival strategies. Approximately 100,000 children now have growth charts, immunization rates have begun to rise sharply, and an initial 1 million sachets of oral rehydration salts have been made available through health posts, day-care centres, local government offices, commercial pharmacies, literacy centres, kindergartens, and the city's youth and women's organizations. To reach the public with the message of ORT, over 100 television 'advertisements' have been broadcast, radio has carried the information up to twenty times a day, and 300,000 leaflets and posters have gone up on walls and in windows throughout the capital city.

Backed by the authority of 250 paediatricians, health workers are carrying child survival messages into the poorest homes of Kabul, over 4,000 teachers are now introducing 'child protection' lessons into the city's schools, and most water and sanitation programmes are also being used to promote both ORT and immunization.

Fig. 8 Impact of ORT on infant deaths, Alexandria, Egypt, 1980–1984

Overall infant deaths (all causes) during the summer 'diarrhoea season' in Alexandria Governorate, Egypt, 1980–84. Figures in parentheses indicate the rate per thousand in age group.



Source: Diarrhoeal Control Newsletter, National Control of Diarrhoeal Diseases Project, Egypt, 1984.

Africa

In Egypt, death rates from diarrhoeal disease have been halved by ORT in a large pilot campaign which has now been extended to the whole nation (Fig. 8). Approximately 8,000 doctors have been retrained and, as of mid-1985, 4,000 clinics had started to use ORT against the diarrhoeal dehydration which kills more than 80,000 Egyptian children each year. To promote *demand*, television commercials for ORT have been broadcast nightly and all doctors are being asked to recommend the new therapy. To meet the demand, 80 million sachets of salts a year are now being locally produced and made available

both from health posts and from thousands of commercial pharmacies.

In late 1981, only 5% of Alexandria's mothers knew about ORT and only about 1% had ever used it. Today, 90% know of ORT and 50% have used it (see panel 9).

Following the successful launch of the ORT programme, President Mubarak has this year made the commitment to universal immunization by or before 1990. At present, more than 50,000 Egyptian children are dying each year from vaccine-preventable diseases.

In Djibouti, the Council of Ministers has approved a plan to halve the country's infant mortality by 1990 and has launched a National Child Survival Plan, to be co-ordinated by a central committee including several government ministers and representatives from the mass media and the national women's organizations.

In Ethiopia, where the effort to relieve the dramatic suffering of the countryside has been the focus of world-wide attention, a quieter effort is also being mounted to try to cope with the everyday crisis facing many of the children of Addis Ababa. Last year, the Ministry of Health and city council set themselves the challenge of reducing the capital city's infant mortality rate from 136 per 1,000 in 1985 to less than 50 per 1,000 by 1990. Supported by the Ministry of Health and UNICEF, the Addis child survival campaign is now going into action through the city's 284 city dwellers' associations or *kebeles*. Volunteers from each *kebele*, trained and supervised by a qualified community health and development agent, are promoting ORT, organizing immunization, and helping mothers to monitor the progress of their children on the newly-designed Amharic growth chart (see panel 15).

In Somalia, a month of radio broadcasts, newspaper articles, TV programmes, loudspeaker announcements, and community meetings have prepared the ground for over 2,500 volunteers, drawn from political parties and women's organizations, to visit 150,000 homes in the capital city of Mogadishu – registering children and urging their parents to bring them to the vaccination centres.

In the Sudan, basic child survival strategies are proving their sharpened relevance in the midst of drought and famine. Through the emergency operations, and through the large-scale water supply programmes, ORT and immunization are combating the diarrhoeal and other diseases to which overcrowded refugee camps and emergency feeding centres are particularly vulnerable. So far, close to 6 million sachets of oral rehydration salts have been distributed during 1985 and hundreds of community health workers have been trained in their use (Fig. 9). Reports UNICEF's office in Khartoum: "*All who have used the salts – including the previously sceptical – say that their effect is remarkable.*" For both ORT and the present immunization drive, demand is being promoted by every means from media blitzes to travelling troupes of nomad players.

The social breakthrough

Not all of these ambitious programmes will succeed. And some of the difficulties which face them will be discussed in the next chapter. But an extraordinary beginning has been made. And in all of these cases, it is clear that the 'social breakthrough' in ways and means of reaching out to the *majority* of parents is just as important as any scientific breakthrough in knowledge about child health.

Steadily over the last ten or twenty years, many nations have levered themselves into a position to make that 'social breakthrough'. And this new potential for mobilizing organized resources, and for reaching out to inform and involve the vast majority of citizens, is today one of the greatest of all resources not only for increasing the protection which can be afforded to children but also for the promotion of national development itself.

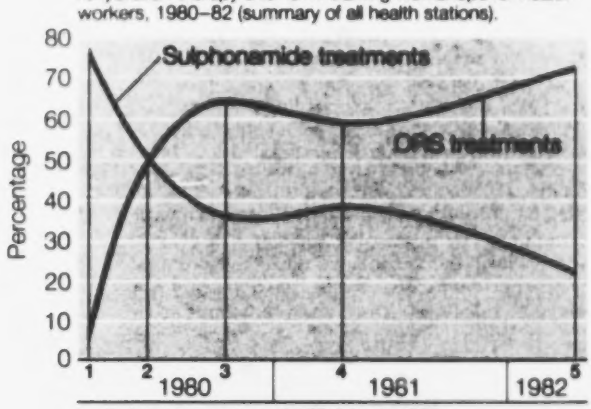
This new potential has been arrived at by a largely unnoticed process of change. And the sheer scale of that change is well illustrated by what has been happening in India. Over twenty or more years, amid many expressions of hopelessness from outside commentators, India has steadily constructed a vast mechanism for social development which is now capable of touching the lives of the vast majority of the nation's 670 million people.

Each of the country's 5,100 'development blocks' now has an organized structure with the capacity to begin reaching out to inform and involve communities in development activities. All of those development blocks now have at least one primary health centre and an average of more than ten subcentres. To staff these health centres over 300,000 doctors and 300,000 paramedics have been trained. And over the next five years the number of 'health guides' is scheduled to double to 600,000 – one for every village in India. And now, under the ICDS scheme, an additional 5,000 *anganwadi* workers and 2,500 supervisors are being trained every year to help bring basic services to all of India's families.[9]

At the same time, tens of thousands of schools have been built and hundreds of thousands of teachers have been trained – putting a primary school within one kilometre of 90% of India's children. As a result, 80% of the nation's children now start school, and literacy – bringing with it a vastly increased capacity for the communication of new knowledge – is steadily rising.[10]

Fig. 9 Changes in treatment for diarrhoeal disease, Sudan, 1980–1982

Change in the percentage of diarrhoeal cases treated with oral rehydration therapy after ORT training workshops for health workers, 1980–82 (summary of all health stations).



1 Before introduction of ORT (March 1980)
2 During cholera epidemic (June 1980)
3 One month after training workshops (October 1980)
4 Seven months after training workshops (April 1981)
5 Nineteen months after training workshops (April 1982)

Source: Tropical Doctor, October 1984.

Nor have the mass media been standing still. Today, the nation has at least 20,000 newspapers, including over 1,000 dailies, and radio services now reach more than 90% of the nation.[11] And unthinkable as it might have seemed only a decade ago, it is now estimated that television will be within reach of as many as three-quarters of India's people before the end of the decade.

Not least among these increases in resources for development is the growth of the more than 12,000 national and international voluntary organizations which are now operating in India, often in the very poorest communities.

These are staggering achievements – with equivalents in many other nations. And since, in most cases, the health services themselves are a necessary but still not sufficient resource for reaching the majority, a full inventory of these 'outreach resources' will need to be taken if present knowledge about low-cost child protection is to be placed at the disposal of all families.

Resources for outreach

Perhaps the most underused of all those resources is the formal education system itself. Over the last twenty years, the developing nations as a whole have more than doubled the proportion of their children who are enrolled in school. And today, at least 80% of all children are enrolling in formal education for at least a few years.

By contrast, only about 20% of the developing world's children have any regular contact with formal health services. In Indonesia, for example, there are 5,000 primary health centres with one doctor each as opposed to 100,000 schools with an average of six teachers each.[12]

In other words, the school system is one of the most important channels of communication with the vast majority of today's and tomorrow's parents. By the most elementary definition of education as a preparation for life, present knowledge about basic child protection techniques is surely worth its place in the world's schools. And the example of Thailand, where child survival and development lessons are now being introduced onto the formal curriculum of 6.3 million schoolchildren, is surely one worthy of being followed by other nations.[13]

Brazil: vaccinating 20 million

Brazil's national programme for mothers and children, launched in October 1984 in the wake of a successful breast-feeding campaign, combines all the child survival measures discussed in *The State of the World's Children* report:-

◯ The regular weighing of children to monitor their growth spearheads the programme; the first health workers began their training in October 1984, in 10 of Brazil's 23 states, and a national growth chart is being tested.

◯ To counter the 80,000 child deaths a year from diarrhoeal dehydration, Brazil is now manufacturing oral rehydration salts for free national distribution and for export to neighbouring states. An estimated 5 million cases of diarrhoea in Brazilian children were treated by oral rehydration therapy in 1985.

◯ To reverse the drift towards bottle-feeding, 50,000 health personnel have been trained to promote breast-feeding. The 'rooming-in' of newborn babies with their mothers, to encourage breast-feeding, is now mandatory in all government-backed hospitals.

◯ Until Brazil introduced vaccination days in 1980, some 2,000 children were paralysed by polio each year. Today the toll is less than 40. Six years on, the National Vaccination Days are an established complement to the regular health services. In 1984 other vaccines were added to the roster: protection of children under one against measles has risen from 58% in 1978 to 80%, and protection against diphtheria, whooping cough and tetanus from 39% in 1980 to 67%. And since June 1985, all children turning up on vaccination day have been fully registered and vaccination cards given to their mothers.

On each of the two yearly vaccination days more than 20 million children under five have been vaccinated against polio. Women's groups, schools, church groups and the armed forces have all participated; newspapers, radio and television, loudspeaker systems and even lottery tickets carry the call to vaccination all over the country. Brazil can now draw on 400,000 experienced volunteers – including teachers, firemen, and police – to man 90,000 vaccination posts across a territory larger than Western Europe.

In a parallel move to safeguard children's well-being, Brazil launched a national breast-feeding campaign, in 1981, which is now part of the mother and child programme. Posters extolling breast-feeding were distributed nation-wide; nearly $1 million worth of radio and television time was donated for breast-feeding 'commercials'; the paediatricians' association, 18,000 strong, actively promotes the campaign; and Brazil's medical schools now include breast-feeding in their curriculum. In the city of Recife, to cite one example, the proportion of children breast-fed at three months has doubled.

The Catholic Church has been a major ally in these efforts. Its 370 bishops and 5,000 priests, along with 14,000 monks and nuns working in clinics and hospitals, backed by newspapers, magazines and 120 radio stations, make it a powerful presence in Brazilian daily life. In 1985 the National Conference of Brazilian Bishops established a 'Pastorate of the Child' to disseminate child survival measures. The Pastorate is expanding this year to tackle an ambitious goal – reaching a million children under six in the impoverished north-east, where infant mortality is running at twice the national rate.

On 28 August 1985, the government also launched a major new initiative for child survival. Encouraged by two pilot projects in urban slums, one of which brought infant deaths down from 76 to 20 per 1,000 live births, the President has launched a national 'Child First' programme, to be put into action by the Brazilian Assistance Legion with funding of $150 million for the first year. Starting in January 1986 in poor urban areas of the north-east, the programme will focus on low-cost ways to improve children's chances of survival.

A second major resource for reaching a majority of all parents is obviously the mass media itself. With a total of 8,000 radio stations transmitting into almost every home, television reaching 50% to 60% of the people in most urban areas, and rising literacy bringing in its wake a rising newspaper readership, the developing world's electronic and printed mass media now have the potential to reach and inform the vast majority of the people in almost all countries.

Usually, the mass media are a necessary but not sufficient source of new information about something as fundamental as family health. If the mother is to make a change in some aspect of child care, then she will need to hear about it, and be convinced of it, from several respected sources. The basic message may be first heard or read about on the radio or in the newspaper, but it may need to be reinforced by the health worker or doctor, sanctioned by a religious or political leader, or approved by her peer group or parents-in-law.

Nonetheless, it has recently been the mass media which have put such subjects as immunization, ORT, and breast-feeding onto the national agenda – and onto the family agenda – in countries like Pakistan, Turkey, Colombia, Brazil, Honduras, Egypt, and the Gambia.

In other countries, the communications resources of organized religion – of the priests and the Catholic Church in Brazil, Colombia and El Salvador, of the imams and Muslim leaders in Indonesia, Oman, and the Philippines, and of the Buddhist priests in the villages of Burma and Sri Lanka – have also helped to bring new knowledge about child protection to many millions of parents, and from a most trusted source.

Next come the resources of the private voluntary organizations. Ranging from a *mahila mandal* women's organization with 200 members in a village of India to a Rotary International with a million members and 21,000 clubs in 159 nations, the non-governmental organizations have been a part of the action in almost every case of child survival campaigns which have reached out to the vast majority of a nation's parents.

To fight diarrhoeal disease, the Red Cross has launched its world-wide 'Child Alive' campaign with the very specific intention of "*preventing child deaths by extending the correct use of oral rehydration therapy*".[14]

Fig. 10 Developing countries producing oral rehydration salts

WHO REGION	COUNTRY
AFRICA	BURKINA FASO*
	BURUNDI
	ETHIOPIA
	KENYA
	MOZAMBIQUE
	ZAIRE
AMERICAS	ARGENTINA
	BRAZIL
	COLOMBIA
	COSTA RICA
	DOMINICAN REPUBLIC
	EL SALVADOR
	HAITI
	HONDURAS
	MEXICO
	PARAGUAY
	PERU*
	VENEZUELA
EASTERN MEDITERRANEAN	AFGHANISTAN
	EGYPT
	GAZA STRIP
	IRAN (ISLAMIC REPUBLIC OF)
	IRAQ
	PAKISTAN
	SYRIAN ARAB REPUBLIC
	TUNISIA
EUROPE	MOROCCO
	TURKEY
SOUTH-EAST ASIA	BANGLADESH*
	BURMA
	INDIA
	INDONESIA
	NEPAL
	MONGOLIA*
	SRI LANKA
	THAILAND
WESTERN PACIFIC	CHINA*
	DEM. KAMPUCHEA*
	MALAYSIA
	PHILIPPINES
	REPUBLIC OF KOREA

*Indicates a cottage industry approach
Note: Countries in bold type are those which are self-sufficient in ORS production
Source: World Health Organization, WHO/CDD/85.13, Geneva 1984.

Pakistan: saving 100,000 lives

11

In June 1985, Pakistan's health planners drew up the balance sheet for the country's three-year Accelerated Health Programme, launched in 1982 to tackle Pakistan's high infant mortality rate of 120 deaths per 1,000 live births.

○ Vaccine-preventable disease: 80% of the budget has been allocated to an all-out effort to immunize every child against the six diseases which kill a quarter of a million Pakistani children every year. Every province has organized mass vaccination drives, which draw on specially trained workers, mass-media campaigns, and every available resource to motivate communities. By June 1985 over 3,000 vaccination posts, motivation teams, and mobile vaccination units were in operation throughout the country.

The graph on page 11 shows the results. In 1982 barely 5% of under-fives were immunized; by mid-1985, 65% were vaccinated, which means that more than 100,000 lives are already being saved every year, and 3 million illnesses prevented. The government is confident that 75% of children will be protected by the end of the year. In the Punjab, where 55% of Pakistan's people live, coverage has already passed the 80% mark. Correspondingly, coverage in areas such as Baluchistan is below average and insufficient to promote 'herd immunity'.

To back up the immunization services, Pakistan is now one of the first developing countries to become self-sufficient in measles vaccine, thanks to a production plant opened in 1984 and financed by the efforts of His Royal Highness Prince Talal of Saudi Arabia.

○ Diarrhoeal dehydration: the second element of the accelerated programme is oral rehydration therapy, to forestall the diarrhoeal dehydration which kills nearly 300,000 Pakistani children every year. And here the record is not so impressive. Production of oral rehydration salts has been stepped up, from 1 million to 22 million sachets a year. But the programme has been less successful in creating demand than in increasing supply. Many doctors have yet to adopt the therapy; many pharmacists prefer to sell more lucrative – and ineffective – drugs; and there is as yet no great breakthrough in putting this life-saving technique at the disposal of the vast majority of Pakistan's parents. Today perhaps only 10% of Pakistan's parents use oral rehydration therapy – despite the fact that diarrhoeal dehydration remains the number one killer of Pakistani children.

In an effort to turn the tide, the Pakistan Paediatric Association has lobbied successfully for some anti-diarrhoeal drugs to be taken off the official drug register, and the Ministry of Health has launched a media campaign, directed at doctors as well as parents, to increase the demand for oral rehydration. Television advertisements are being broadcast at prime time to educate parents about oral rehydration and other low-cost measures that can save their children's lives.

○ Training traditional birth attendants: the third element in the training of traditional birth attendants (TBAs). For the majority of Pakistan's mothers, TBAs are the maternal and child health services. They deliver 80% of babies in rural areas and their level of knowledge – about pregnancy, safe delivery, hygiene, and infant care – is a key determinant of maternal and child health through the nation.

The aim is to train 50,000 TBAs so that every village and slum in Pakistan will have at least one TBA able to deliver babies safely and offer sound advice on health care. So far, 15,000 have received three months' training and have returned to their communities.

With the balance sheet looking so healthy, Pakistan is extending the Accelerated Health Programme for another three-year term. If the second term can match the achievements of the first, Pakistan will have dramatically improved its children's chances of survival and of healthy growth and development.

On the immunization front, Rotary International's Polio 1990 initiative and the Save the Children Fund's Stop Polio campaign are helping government health services to fight the paralytic polio which is still disabling *5,000 children a week* in the developing world. And as part of their world-wide Child Alive programme, national Red Cross societies have been heavily involved in the success of the recent immunization campaigns in the Americas – fielding more than 13,000 volunteer vaccinators for the Colombian campaign alone.

For the promotion of knowledge about vitamin A, Helen Keller International (HKI) is now launching a $6 million Child Survival Plan to "*make a dramatic impact on child survival by preventing and treating widespread vitamin A deficiency in countries where children are at grave risk of blindness and child mortality*".[15] At the same time, HKI has also moved 5 million doses of vitamin A into the camps of Ethiopia and the Sudan where it is not untypical for 10% of children to have advanced symptoms of vitamin A deficiency and where many are irreversibly blind.[16]

In the industrialized world there are now over 3,000 voluntary organizations sending an estimated $1,500 million a year to their counterpart organizations in the developing world. And in the developing nations themselves, uncounted thousands of organizations – an estimated 6,000 in Bangladesh, for example – are working with the people of the poorest villages and neighbourhoods where children are most at risk.

In each nation, local knowledge and creativity will usually be able to pick out other ways and means of reaching out to particular groups of parents. In Brazil, for example, child survival is now one of the 'badges' which can be earned by the nation's 10 million Boy Scouts. In Colombia, the government has decided to boost its National Plan for Child Survival and Development by creating a force of 180,000 'health guards' through a law which obliges all fourth-year high-school students to be trained in child survival knowledge and to serve at least 100 hours a year in the community. In Nepal, an attempt is being made to take advantage of a contraceptive distribution system in order to promote sachets of oral rehydration salts through the same 5,000 retail outlets. In Indonesia, it was the structures set up to promote family planning, and the 10,000 family planning workers already in place across the country, which made possible the subsequent launch of the Family Nutrition Improvement Programme (see panel 13). In the Middle East, it is the national women's organizations (in Oman and the United Arab Emirates) and the women's unions (in Iraq, Syria, and Democratic Yemen) who have begun to take a particular interest in the promotion of immunization and ORT. In Nigeria, it has been the traditional chiefs who have helped immunization campaigns to reach much larger numbers of parents. In Honduras, local mayors or alcaldes have lent their authority to the messages about ORT going out on the radio stations. In India, villagers who have been trained to maintain village hand-pumps are now also being trained to promote ORT along with the clean water supplies. In Brazil, the traditional healers or rezadeiras are also promoting ORT. In Bombay, schoolchildren have both prepared the lists of all under-ones in the community and helped to inform their parents of the times and places for immunization. In Haiti, over 2,000 ordinary homes which are also small shops for everyday provisions like batteries and soft drinks are now selling sachets of oral rehydration salts as well.

Primary health workers

When formal health services reach only a minority of the population, it is only by mobilizing all of these resources that present knowledge about family health can be broken out of its medical show-case and put into the hands of millions of families.

But experience has shown that all of these new ideas about health are put into practice more quickly and more surely if there is a health worker, even one with only a few weeks' or months' training, who actually lives in the community and who is there at the time the mother most immediately needs the advice about how to use the new oral rehydration therapy, about going for an injection in pregnancy, about whether to take a child for a third immunization, about

continuing to breast-feed or about when to begin weaning. If such a person is part of, and available to, the community, whether it be an anganwadi worker in India or a *promotora de salud* in Colombia, then all other messages from all other sources are more likely to take root.

At the moment, there is still a long way to go before every village and neighbourhood has access to modern knowledge of family health methods via some kind of resident trained health worker.

In most developing countries, three-quarters or more of the health budget is still devoted to expensive hospital and doctor-based care for less than 20% of the population.[17] In most countries, primary health care is still something to be tacked on to the existing health services – if there is anything left in the budget when the hospitals and the urban-based curative services have been paid for. In most countries, there are still too few primary health care workers with too little training and supervision and with not nearly enough support from referral services. But despite all this, progress has been made in the last few years.

Almost all developing nations have now adopted primary health care as official policy. In some, that commitment is so far only rhetorical. In others, there has already been a significant rise in the numbers of paramedics and community health workers:-

In China there are over 2 million 'barefoot doctors' at work in the community. In India, as has already been mentioned, there are now over 300,000 health guides at work and there will soon be 600,000 in villages throughout the country.[18] But these, the two most populous nations of the world, are not the only examples of large-scale training of paramedical staff.

In Burma, 26,258 community health workers and 8,700 auxiliary workers have been posted and the plan is now to put one community health worker in each of Burma's 65,000 villages.

In Thailand, 43,000 village health workers and over 419,000 'health communicators' have been trained to bring basic health messages to families in over 90% of all villages. In total, Thailand now has more than 7,000 health centres, each staffed by a trained midwife and a health sanitarian (see panel 21).[19]

In Pakistan, tens of thousands of traditional birth attendants are being trained in basic mother and child protection strategies (see panel 11).

In the Republic of Korea, community health practitioners are now available to over 80% of all rural people.

In Bangladesh, there are now 23,000 trained midwives and 30,000 more are scheduled to be trained by 1990.

In Nepal, there are now almost 2,000 auxiliary health workers, with either one or two years' basic training, working in 800 rural health posts.

In Tanzania, 90% of the population now lives within 10 kilometres of a health post (and over 70% within 5 kilometres).

In Niger, 13,000 community health workers have been trained to serve almost 4,000 villages.

And in three-quarters of all the developing countries, there are now some kind of training programmes for the traditional birth attendants (see panel 11) who are relied upon by the majority of the world's mothers for help and advice in matters of bearing and caring for children.[20]

In summary, the techniques and the knowledge for a revolution in child survival are now available. The capacity to inform and support parents in bringing that revolution about – and beginning to put primary health care into practice – is also in place in most nations of the world. The only catalyst needed to compound these two elements into a practical improvement in the lives of the world's children is therefore the political will and commitment to do it.

In several nations, nations where that political will and commitment have already been demonstrated, it is already clear that there is going to be a steep fall in the rate of child malnutrition and child deaths over the next few years.

But in all countries, there are important difficulties to be acknowledged.

The benefits for women

The greatest of those difficulties is the fact that the majority of the developing world's women have too large a share of responsibility for family well-being and too small a share in the decisions which affect it.

For whether we are talking about breast-feeding or weaning, oral rehydration therapy or immunization, regular growth checking or frequent handwashing, it is obvious that the mother stands at the centre of the child survival revolution.

Acquiring and applying present knowledge about child health therefore makes great demands on the mother. But as this chapter will summarize, strategies for protecting the lives of children are also among the most important strategies for improving the lives of women. Inasmuch as they save considerable amounts of money, they effectively increase a woman's income. Inasmuch as they prevent illness and disability, they liberate a woman's time and energy. Inasmuch as they save lives, they help to liberate women from the trap of too-frequent pregnancy (see panel 25). Inasmuch as they empower a woman to protect her own and her children's health by her own actions, they increase a woman's ability and confidence to take more control over her own life.

On 26 July this year, at a World Conference in Nairobi, the United Nations Decade for Women formally drew to an end. And although it is not possible here to examine the whole fabric of issues which has been woven during the Decade, it is useful to follow those strands which lead directly to the quality of children's lives and to the capacity of mothers to bring about improvements:-

First of all, the Decade has dispelled forever the idea that 'farmer' is a masculine noun. Survey after survey has shown that women often work more hours per day and more days per year in the fields than their menfolk (Fig. 11) and that they are directly responsible for producing more than half of all the food grown in the developing world.[1] In West Africa, for example, women do 70% to 80% of all agricultural work and produce 40% to 50% of all staple food crops.[2]

Then, after spending up to six or seven hours a day planting, weeding, hoeing, threshing and gleaning, the woman returns home to the tasks of pounding and winnowing, grinding and boiling, drying and storing, carrying and marketing, cooking and serving.

After feeding the men and seeing that the children have eaten, she herself eats a small proportion of the food she has grown. Then she turns to the tasks of washing the pots, cleaning the house, sweeping the compound, bathing the infants, mending the clothes, laying out the bedding, feeding the animals, tending the kitchen garden, going to the market, fetching the firewood, carrying the water, and looking after the elderly, the sick ... and the children.

In other words, women put in approximately twice as many hours of work as men.

At the same time, the Decade for Women has also brought out the fact that many millions of the world's women are permanently in poor health. To take one indicative example: almost half of the women in the developing world are anaemic – and among pregnant women that figure rises closer to 60% (see Lifelines: iron, iodine and vitamin A).[3]

The cause is not usually a specific illness. It is rather the general 'maternal depletion' caused by too much work and too little food combined with too many pregnancies too close together.

From girlhood to womanhood, the females of many societies are fed last and least.* Malnutrition in girls is much more common than among boys and the fact that, on average, an American woman weighs approximately 25% more than an Indian woman is to be explained not by race but by food.[4]

Frequent pregnancy sharpens the problem. Poor growth in her own childhood may have left the mother less able to withstand the heavy

* *"The cumulative result of poverty, under-nutrition and neglect which girls suffer right from birth is reflected in their poor adult body size, which in turn influences high maternal mortality, low birthweight and poor nutritional status of their infants. The relative neglect of the female child is evident from the greater prevalence of growth retardation even in infancy among girls than in boys..."*.[5]

Nicaragua: child deaths down 30%

12

In the 1960s and 1970s Nicaragua had one of the highest levels of infant mortality in Latin America. Diarrhoea was the chief killer of infants and children, followed by respiratory infections, tetanus, measles, malaria and whooping cough.

After the change of government in 1979, Nicaragua's health and social security systems were reorganized to begin building a comprehensive primary health care system. In four years, the number of health posts and health centres was trebled, and over 80% of the population now has access to free primary health care.

Limited resources have meant searching for low-cost, high-impact, community-based ways of protecting the health of mothers and young children. So health activities have centred around child growth monitoring, diarrhoeal disease control, promoting breast-feeding and appropriate weaning, immunization, family food supplements and the care of pregnant and lactating women.

But improving health care is not equated only with the expansion of government services. Health is also seen as the responsibility of organized people's groups. 'People's health councils' enable trade unions, neighbourhood organizations, and associations of young people and women to take an active role in carrying out health programmes.

Building on the experience of the national literacy crusade in 1980, a series of People's Health Days (*jornadas populares de salud*) was launched in 1981. Co-ordinated by the people's health councils, the health days have become the leading edge of campaigns against malaria, dengue fever, polio and measles. In 1981, the malaria and dengue campaigns involved 1.9 million people (70% of the population) and 70,000 volunteer health workers, or *brigadistas*. Every year, on three week-ends between January and June, the anti-polio and measles campaigns regularly mobilize around 20,000 *brigadistas*.

Improved water supplies and sanitation have reduced the incidence of diarrhoea among young children, and deaths from dehydration have been cut by setting up 356 oral rehydration units in health centres and health posts. Nurses at the units teach mothers how to mix and administer oral rehydration salts, and also educate them in preventing diarrhoea through continued breast-feeding and better hygiene in the home. The salts are now due to become widely available from *brigadistas* and through outlets such as small shops and market-traders. To meet the expected demand, UNICEF is supplying 1.5 million packets of oral rehydration salts a year.

Mass communications play a key role in the health campaigns. Neighbourhood organizations produce their own posters, leaflets and notices, and announce forthcoming health days with loud-speakers mounted on cars.

Nicaragua's programme has already yielded results. Since oral rehydration therapy was introduced in 1980, the death rate among children with diarrhoea in hospitals has fallen by 42%, and diarrhoea has fallen from the first to the fifth cause of child death. Immunization rates rival those of some developed countries. In 1984, according to UNICEF estimates, 97% of infants were protected against tuberculosis, 80% against measles and 76% against polio. No polio case has been registered since 1981. Immunization against diphtheria, whooping cough and tetanus is increasing, but only 33% of infants were fully protected in 1984. Neonatal tetanus is still prevalent, but a nation-wide campaign begun in 1983 aims to vaccinate all women of child-bearing age.

Although some important issues still remain to be tackled, Nicaragua's focus on the priority health problems of women and children is having a measurable national impact. Between 1978 and 1983 the overall infant mortality rate fell by one-third, from 121 to 80 per 1,000 live births – one of the most dramatic improvements in child survival in the developing world.

nutritional burdens of pregnancy and breast-feeding.[5] A pregnancy every eighteen months with nothing in between but hard work, frequent illness, and poor food, gradually depletes the mother's body of protein and calories, health and energy. And if the late stages of pregnancy also happen to coincide with the season of heaviest work in the fields, then the mother-to-be may even fail to gain any weight at all as her pregnancy advances.[7]

The net result is that the mother's time and energy – the most valuable of all resources for improving child health – are eroded by both the poverty and the injustice of her circumstances.

Inevitably, short cuts have to be taken merely to reach the end of the day.

To save time and firewood, the mother may cook food less frequently and in larger quantities – storing it for longer in unhygienic surroundings and at tropical temperatures.

To allow a long day's earnings in the fields or plantations, an infant may be left with an eight-year-old brother or sister for the whole day.

To save a trip back from the fields or the market, a young child may be fed only twice a day, at adult mealtimes, instead of the four or five smaller meals which a young child's small stomach needs.

To save firewood, water may go unboiled. And to save an hour's trip to the well, the family's hands may not always be washed after using the latrine or before preparing the food.

To save time in cooking, the mother may cut down on protein-rich foods like pulses which usually take longer to prepare.

To save making special weaning foods, children may be weaned on a porridge made from the same food as is given to the adults – even though children need more calorie-dense foods to avoid becoming malnourished.

To save coming home every few hours, the mother may only breast-feed her infant two or three times a day – even though this may lead to less milk and the premature ending of breast-feeding. Or she may decide that using artificial infant formula in a bottle is worth the expense as it means that somebody else – a sister or a grandmother – can feed the child and allow the mother to carry on working.

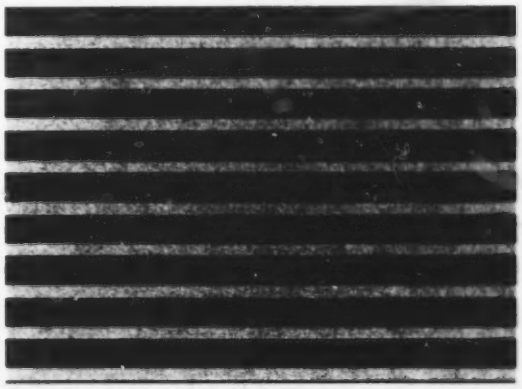
To save time and energy in the fields, she may switch to less demanding food crops like cassava instead of maize or rice, not knowing of the nutritional losses this will bring to her children.

To make sure that the staple crop is planted or harvested, she may neglect the kitchen garden, even though it is the source of the vegetables, beans, or fruits which provide the minerals, the oils, the vitamin A, which are essential ingredients of the young child's diet.

Fig. 11 Male and female shares of agricultural tasks and training, Africa

AGRICULTURAL WORK

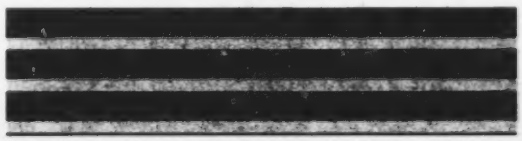
Division of rural labour by task and sex, Africa



Source: Economic Commission for Africa, 1975.

AGRICULTURAL TRAINING

Male and female participation in agricultural training programmes, Africa



Source: International Children's Centre, "Children in the Tropics", Issue No 146, Paris, 1983.

Indonesia: one million health workers

13

In over 40,000 of Indonesia's 67,000 villages, trained village volunteers, or *kaders*, are working to help their community protect its children's health. One result is that 5 million Indonesian mothers are now regularly weighing their children and checking up on their growth.

The *kaders* are chosen by their communities for brief training and usually serve 10 to 15 households. Their duties include helping mothers to weigh under-fives every month; providing advice on nutrition; distributing food supplements to malnourished children; supplying vitamin A, iron supplements and oral rehydration salts; promoting family planning and issuing contraceptives; and mobilizing villagers for immunization.

Close to one million *kaders* are now in place, in a country with 160 million people. A quarter of a million of them work with the family planning programme. Some 400,000 work with the Family Nutrition Improvement Programme. Three-quarters of a million work with Indonesia's family welfare movement as well. Many *kaders* work with two or more of these different programmes.

The idea of village volunteers is not new to Indonesia. The age-old tradition of *gotong-royong*, or mutual self-help, puts great value on voluntary work for the community, and played an important role in spreading the message of the 'Green Revolution' which so dramatically raised Indonesia's rice yields in the 1970s. Largely because of this voluntary tradition, the basic services provided by nutrition *kaders* cost only $2 per child per year.

A 1983 study reviewed the effectiveness of nutrition *kaders* in seven villages in Bali, Java and Sumatra with a total population of 16,000. The researchers found that:

- 89% of under-fives regularly attended the monthly weighing sessions.
- 85% of mothers believed in maintaining or increasing their food intake during pregnancy – a practice running counter to traditional beliefs.
- 75% of mothers breast-fed for two years or more.
- Almost 90% of mothers added vegetables and more energy-rich food to their child's diet before the age of a year.
- 51% of children had been immunized against tuberculosis and 57% had had two shots against diphtheria, whooping cough and tetanus.
- 65% of mothers knew about oral rehydration to prevent diarrhoeal dehydration; 57% could mix the pre-packaged oral rehydration salts and 47% knew the ingredients for making a salt and sugar mix at home.

Such figures have yet to be reached on a national scale. Improved child nutrition has been hard to document; children in need of referral have slipped through the net; and *kaders* have sometimes fallen short in the time-consuming task of counselling mothers about health and nutrition. A quarter of the 400,000 nutrition *kaders* have moved or dropped out.

Nation-wide only 50% of children who could come for regular weighing actually do so, and those who stay away may well be those most in need – a problem common to most programmes aiming at universal coverage.

Even so, the figure of 50% compares well with the 10% of under-fives attending health clinics. And the perplexing variety of services *kaders* provide are now being brought together in the *posyandu* – the 'one-stop' health post, where the monthly weighing session also supplies the setting for health, immunization and family planning services.

Another million *kaders* are due to be trained by the end of the decade, and Indonesia looks set to achieve its stated goals for 1989: lowering its infant mortality rate to 70 deaths per 1,000 live births, raising immunization levels to a minimum of 65%, and extending the Family Nutrition Improvement Programme to every village in the country.

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To save losing a day's work in the fields during harvest time, she may decide that one immunization is enough.

To save an hour's walk to the clinic when she is pregnant, and possibly two hours queueing in the sun when she gets there, she may decide not to bother with another pre-natal check or a second tetanus injection. And to save yet another trip with an eight-month-old baby to carry, she may decide not to bother weighing the child that month.

To have more help with all of this, a woman may decide that she needs more daughters – and that she needs them at home, not in school.[8]

Saving time, money, and energy

All of these demands on the time and energy and health of women help to explain, if not to solve, one of the most intransigent of all development's problems – the problem of 'reaching the poorest'.

For although it is among the poorest 25% or 30% of a nation's people that the problems of malnutrition and ill health are concentrated, it is also in this group that women have the least time and energy, the least information and confidence, to become involved in acquiring and applying new knowledge or taking advantage of available services.

The problem is one which runs like a fault line through most development efforts in most nations. For whether we are talking about methods of improving the productivity of the land or methods of improving the growth and development of children, it is the poor, those whose need is greatest, who have the least surplus of resources – of money, time, energy, health, knowledge and confidence – to invest in improvements. That is the catch-22 of poverty. And it means that the problem is perpetuated through a cycle of poor nutrition, poor health, poor performance at school and at work, poor productivity, low income, no surplus money or effort to invest in improvement, leading to continued poverty, continued poor nutrition ... and so the cycle goes on.

Protecting the normal physical and mental development of children is clearly essential if that cycle is ever to be broken. Today, because of new knowledge and new outreach capacity, that protection can be provided to the majority of the poor world's children at a cost which is within the capacity of most of the poor world's families. But for all the other kinds of support which will be necessary to bring this about, the critical health worker at the centre of the child survival revolution is still the child's mother.

Does the fact that so many women are so overworked mean that there is no realistic hope of new knowledge and new techniques being acquired and applied? Or can the major low-cost ways now available for protecting child health also allow mothers themselves to save both time and money and conserve their own health and strength?

Answering that question means looking at some of the practical and everyday aspects of the techniques themselves:-

Breast-feeding, although taking a considerable amount of the mother's time, can save the $200 to $300 a year which is the average cost, in a developing country, of bottle-feeding a baby on artificial infant formulas.[9] A family living on the official minimum wage in Mexico, for example, would need to spend 25% of its food budget on milk formula to provide enough for just one infant.[10] In Africa, the proportionate costs are even higher – and even an employed person, say a hospital cleaner or a government clerk, would have to spend over 30% of his or her monthly salary to buy enough milk powder for a two-month-old infant.[11]

In addition, breast-feeding usually delays the return of menstruation and offers the mother a considerable degree of protection against the stresses of another pregnancy following too close upon the last. On average, the post-natal period of infertility lasts for 3 months for a woman who does not breast-feed at all and for 13 months for a woman who breast-feeds for 18 months.[12] And although not a totally reliable method of contraception from the individual woman's point of view, it is still the case that, on average, each

additional month of breast-feeding can give the mother an additional month of protection against pregnancy.[13]

Not least, breast-feeding can halve the number of illnesses – particularly diarrhoeal and respiratory infections – which a child has to be nursed through in its first year of life (Figs. 12 and 15).

Oral rehydration therapy also offers savings of both money and time. For of all the childhood diseases which a mother has to cope with, diarrhoea is the most frequent. Each episode usually lasts four or five days and there may be as many as six or more episodes a year. And in the one study on the subject so far, it has been found that the average length of diarrhoeal illness was reduced from just under five days to approximately two and a half days in homes where ORT was used.[14] The result is not only a reduction of nursing and worrying time, but also less bathing of children and less washing of soiled clothes.

Once a mother has the confidence to use ORT in her own home, being certain that it is the best possible therapy, then the time, travelling expenses and treatment costs of clinic and hospital visits can usually be saved. In most developing nations today, diarrhoeal disease and respiratory infections are the two most common reasons for visits to pharmacies, health clinics, and hospitals. In some countries, families are now spending up to 10% of their income on anti-diarrhoeal drugs which are of no value.* The early use of oral rehydration in the home will normally mean that dehydration will not set in and a clinic visit will not be necessary. But even if the diarrhoea persists and dehydration begins, a child who has been treated at home with an oral rehydration solution will arrive at a clinic in better condition and can be given the necessary treatment (with WHO/UNICEF-formula oral rehydration salts or, in more extreme cases, intravenous therapy) in less time and at less expense and with greater certainty of success.

Immunization would take out at least two or three major, worrying illnesses which a child would otherwise have to be nursed through. It would also prevent at least half of the childhood disabilities, especially paralytic polio and blindness, which have a serious effect on the life of the mother as well as on the development of the child. With full immunization, for example, the chances of a child becoming disabled are reduced by approximately 30%.

Similarly, low-cost action to fortify diets with vitamin A, iodine, or iron may be essential for protecting the normal development of young children in certain areas of the world (see panel 22). And the time taken to include these minerals and vitamins in the diet – or to collect capsules from a clinic – can also protect the mother from the consequences of a child's disablement. Vitamin A supplements, or the inclusion of more green vegetables in the child's meals, could save the eyesight of the quarter of a million children who now go blind each year from vitamin A deficiency. But the same action could also save the mothers of those children from the agony of watching their children's eyes slowly cloud over and from the lifelong extra work of bringing up a sightless child. In other areas, going for iodine injections or buying iodized salt is necessary to protect both the foetus from brain damage and the mother from the consequences of giving birth to a permanently retarded baby.

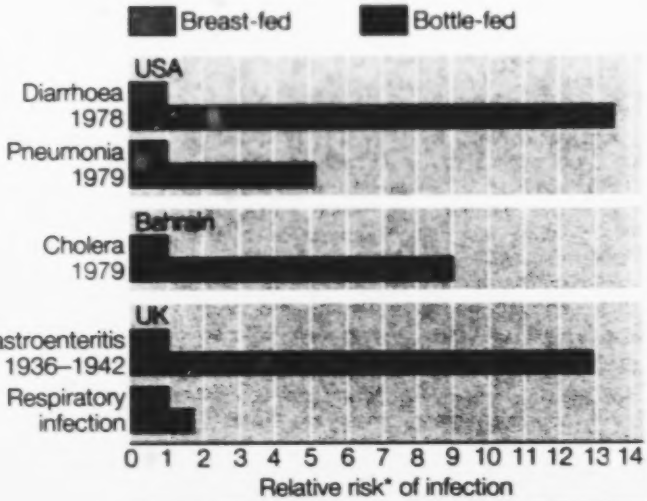
Growth monitoring will normally mean a visit to a clinic or a village weighing centre once a month. But it too can repay with interest the time invested. The main aim of regular growth monitoring is to bring the mother into regular contact with basic advice and help on child health and to give that mother early warning of any faltering in her child's growth. And at that early stage, relatively cheap and simple action can be taken to stop the child from slipping into the cycle of malnutrition and frequent illness – a cycle which takes such a toll both on the child's growth and on the mother's time and energy.

Those demands on a woman's time caused by the sheer frequency of child illnesses are hard to imagine from the perspective of the industrialized world. In very poor countries, children may be ill for 30% to 50% of their young lives. According to

* The import and sale of anti-diarrhoeal drugs has recently been banned in Jordan and the Sudan and, in Syria, the government subsidies for such products have been withdrawn.

one survey in Bangladesh, for example, the average child has one illness or another for 75% of all the days of its life.[15] Such figures mean that a mother, with perhaps three or four children to look after, is permanently coping with the illness of at least one child. And not only does this take time, it also costs money. Many families in the developing world spend over 10% of their income on health – in travelling expenses to clinics, in costs of medicines, and in fees to doctors or traditional healers. In a country like Malawi, for example, it has been calculated that one-third of the nation's total expenditure on health is spent by families themselves.[16] Or in Honduras, where the average family sustains about thirty illnesses a year, the direct cost to the family is approximately $7.50 per illness or a total of over $200 a year – half of which goes on drugs.[17] So the financial costs of illness, as well as the costs in the mother's time, energy, and worry, are proportionately much higher than in the industrialized nations.

Fig. 12 Relative rates of infection by feeding method



*Relative risk is the number of cases appearing in 100 bottle-fed babies divided by the number of cases in 100 breast-fed babies from the same socio-economic environment over the same time period.

Source: *Journal of Tropical Pediatrics* vol. 8, No. 4, August 1982.

Growth checking, as a focal point of child health protection, could bring together present knowledge both about the prevention of illness and about the special weaning and feeding needs of the young child. The result could be at least a 50% reduction in the days spent in illness during a child's earliest years.

The 'three Fs'

In previous years' reports, child survival and well-being has also been shown to be closely related to the 'three Fs' of family spacing, food supplements, and female education. All of these exert powerful upward leverage on a child's chances of survival and normal growth. But all of them also exert powerful upward leverage on the well-being of women themselves:-

Family spacing. Leaving at least two years between one pregnancy and the next can reduce the risk of an infant's death by 50% or more (Fig. 14). But it is also one of the most important ways, perhaps the most important way, of maintaining the health of those whose bodies are depleted by the heavy nutritional stresses of almost continuous pregnancy, child-bearing, and breast-feeding. In most developing countries, 'maternal causes' are the leading cause of death for women between the ages of 25 and 35.[18] In other words, more than a thousand young mothers are now dying every day – and many of those 'maternal deaths' are the result of too many births too close together.

Female education. The education of the mother has been found to be perhaps the most important social determinant of a child's chances of survival – even allowing for differences in economic class (see Lifelines: female education).[19] But it too is a powerful force for improving the lives of mothers themselves.

Even with only four or five years of schooling in which to achieve basic literacy, a woman stands a very much higher chance of acquiring the knowledge and the confidence to plan and space her pregnancies, to make use of available health services, to discover and apply new knowledge, to work outside the home and earn a higher income, and to participate in the family and community decisions which affect her life.

Somalia: protection in emergencies

14

The basic strategies now available for bringing about a revolution in child survival are nowhere more relevant than in Africa, where the present crisis is exacerbating the basic health problems faced by children in all poor communities. An example from Somalia:-

During April and May 1985 an epidemic of cholera, the swiftest and most lethal of diarrhoeal diseases, swept through an encampment of 45,000 Ethiopian refugees at Gannet in north-west Somalia, killing 1,300 people, many of them women and children. In the neighbouring town of Hargeisa only 33 people died – thanks to Hargeisa's primary health care programme and the health workers who were immunizing children against the main killer diseases of childhood.

Hargeisa, with a registered population of some 120,000, is the capital of one of ten regions where primary health care services are being established. But even though immunization was available, only 15% of Hargeisa's children were fully vaccinated. As the possibility of famine loomed in late 1984, along with the risk of measles deaths in children weakened by malnutrition, the decision was made to vaccinate Hargeisa's children as quickly as possible.

The first round of vaccinations was set for January 1985. To complement Hargeisa's regular vaccinators, student nurses were trained; vaccine supplies were ordered in, local officials were briefed, and the leaders of tabellas (units of 50 families) registered all the children under five in their *tabella*. Radio programmes, jingles, loudspeakers and stickers advertised the campaign. During that first round, all of Hargeisa's 15,000 under-fives were vaccinated against measles and received their first doses for polio, diphtheria, whooping cough and tetanus.

The second round was about to start when cholera broke out at Gannet and threatened the town. Already trained in oral rehydration therapy for diarrhoea, the primary health care personnel worked day and night alongside the townspeople to treat victims and contain the epidemic. The outbreak was stemmed before it could claim more than 33 lives.

A massive outbreak followed the cholera. In Gannet 385 children died. In Hargeisa no child died.

Encouraged by these results, the government adopted a more ambitious goal – immunizing the 65,000 children of the capital city of Mogadishu, where the regular vaccination services were reaching only 11%. The first step was a pilot campaign in early 1985, in a poor neighbourhood where fewer than 3% of children under two were fully vaccinated; in three months the rate had risen to 45%.

The first round of the city-wide campaign was launched on 3 July after a month of intensive preparations involving over 2,000 political and community workers, 500 other volunteers, and 500 student vaccinators. Community meetings were organized, training courses set up, and radio talks, spots and jingles broadcast every day. Press articles, television programmes, loudspeaker announcements, leaflets, banners and car bumper-stickers publicized immunization. Volunteers visited some 150,000 homes to register children under five and urge parents to take them to one of the city's 62 vaccination centres, 50 of them opened specially for the week-long campaign. More than 55,000 children – 86.5% of the children who had been registered – were brought to the centres, and over 17,000 women received tetanus shots.

When Hargeisa and Mogadishu have completed their vaccination programmes, about a fifth of Somalia's children will be protected. The presidential directive which established the Mogadishu campaign requested all other regions of the country to run similar immunization campaigns, so that all the country's children will be protected.

Food supplements. A relatively small amount of extra food each day, for at-risk pregnant women, has been shown to reduce the incidence of low birth-weight which is "*universally and in all population groups, the single most important determinant of the chances of the new-born to survive and to experience healthy growth and development*".[20] Similarly, extra food for breast-feeding women can mean more successful and longer lactation.[21]

But as well as being a key child survival strategy, extra food is obviously just as vital for maintaining the nutritional health of the mother herself. In the industrialized world, an average woman gains approximately 12 kilos in weight during her pregnancy[22] – much of which is accounted for by the fat stores and the energy reserves needed for child-bearing and breast-feeding. Many of the developing world's women – women with too much hard work to do and too little good food to eat – gain only 6 kilos or less in pregnancy and therefore do not build up any adequate reserves.[23] But the baby will still be born and will still breast-feed – at the inevitable cost of depleting the mother's own nutritional health.

Support for women

Applying present knowledge about protecting the lives and the normal development of children could therefore be the kind of investment which would yield returns in time, money, health, and energy for women in poor communities. But to take full advantage of this opportunity, women in most poor communities will need more support – from their own societies, from the international community, and above all from men.

They need basic technologies to save time and energy in the growing, processing, cooking and storing of food – including improved agricultural tools and machinery, grinding mills for grain, more fuel-efficient stoves and utensils, easier methods of collecting and conserving water, and less back-breaking ways of getting food from the fields to the market.

They need the kind of development programmes which do not discriminate against them by enlisting their labour in cash-cropping to improve men's incomes from land which women have traditionally used for 'minor crops' to improve and vary the family diet. For during the Decade for Women, a series of surveys has shown that the commercialization of economies in the name of development has frequently resulted in a further transfer of power from women to men.[24] Most women, for example, used to have some degree of control over what was done with the available land and the food that was grown on it, whereas men have almost total control over what is done with the income from cash crops.[25] And the evidence is that women devote a significantly higher proportion of the income at their disposal to the feeding of children.[26]

Next, women need credit and training (Fig. 11) in order to buy and to use the fertilizers, pesticides, irrigation equipment, and other technologies which could increase their productivity – and their investable surplus – as the principal producers of food. And over the last few years, the 80,000 landless women of the Grameen Bank project in Bangladesh have disproved the idea that poor women are also a poor credit risk. Loaned a total of $11 million, the Grameen Bank women have invested it so successfully in income-earning opportunities that their community repayment record has remained at 100%.[27]

In many areas of the world, women also need land reform to ensure that they are not forced to grow food on ever smaller and more marginal lands before finally having to pack up and leave for the nearest city where they must get what work they can while struggling to bring up their children in overcrowded slums.

From employers in the cities, women need not only a decent day's pay for a decent day's work but also civilized provision for child care, breast-feeding, and maternity leaves. And in the countryside, they need a living wage for day-labour instead of rates which are so much lower than men's that, to take an example from Tamil Nadu, women can find employment for 310 days of the year whereas men can only work for 190.[28]

From the health services, they need more conveniently located and better organized clinics so that the average waiting time is less than the 2 hours 42 minutes which was recorded in a recent survey in West Africa.[29] And they need immuniza-

Ethiopia: the silent emergency

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1985 has been the testing-period for the programme launched a year ago by Ethiopia's Ministry of Health and the city council of Addis Ababa to cut the city's infant mortality by two-thirds, to less than 50 deaths per 1,000 live births by 1990.

While the stark images of drought and hunger in the Ethiopian countryside have become familiar the world over, the quieter emergency facing the children of the country's capital has gone unheralded. Yet some 12,000 children have been dying every year in Addis Ababa – drought or no drought – from the same diseases which have brought death to the relief camps in the north.

The basic methods being used to save lives in the city's poorer quarters are therefore the same techniques which have saved so many lives in the camps – immunization against the diseases which can decimate children in crowded conditions, oral rehydration to prevent dehydration from diarrhoea, and regular growth monitoring to help prevent children from slipping into the downward spiral of malnutrition and infection.

So far, 1,062 volunteer health promoters have been recruited, supervised by 128 community health and development agents with two months' training: all necessary vaccines have been imported, 150,000 sachets of oral rehydration salts have been distributed, and a national growth chart has been designed. At the same time, the city was also tackling the harder task – informing and supporting all parents in taking new action for their children's health.

The 284 city-dwellers' associations (*kebeles*) spearhead the effort. All of the city's 1.5 million inhabitants are *kebele* members, and many also belong to mass organizations.

In each *kebele* teams of six volunteers from the mass organizations, backed by the health promoters, are encouraging parents to have their children immunized and teaching mothers how to prepare the oral rehydration salts available free from *kebele* co-operative stores.

The press, radio and television issue frequent messages on child survival, and all *kebeles* receive leaflets and posters, their impact reinforced by the literacy campaign which in five years has drastically reduced illiteracy, especially among women.

With the support system in place, on 13 February 1985 the Minister of Health launched an eight-month campaign in Addis Ababa to immunize every child under two against the six main killer diseases of childhood, and every pregnant woman against tetanus – 89,000 under-twos and 36,000 women in all. At the time, only 25% of under-twos and only 6% of pregnant women were immunized.

Five vaccination teams have moved steadily from one *kebele* to the next, preceded by a week-long publicity campaign. The area is flooded with posters and flyers; health promoters and volunteers go door to door urging attendance at the vaccination session. Members of the women's and youth associations visit every household, registering children and pregnant women so the health services can follow up on non-attenders. On the eve of vaccination day a loudspeaker van tours the *kebele*, broadcasting the call to vaccination.

The turn-out has been consistently high. In the first three weeks alone, over 7,500 women and children received their first vaccinations in 58 *kebeles*. By the end of September, over 50% of the city's children were immunized.

To reinforce the programme, the city's sanitation and regular health services are being upgraded, and supplementary feeding centres are planned for children whose growth chart shows them to be malnourished. The government now plans to extend the programme to other towns and regions, so that more of Ethiopia's children will be shielded from the worst that the future may bring.

tion days which are not set during the weeks of heaviest agricultural work or at times of the year when poor women have to travel to seek day-labour in factory or plantation.

From the legislators, they need new laws to oblige fathers to help support their children in rapidly modernizing urban areas where traditional structures of obligation and responsibility may no longer be enforced by any kind of sanction.

From the educators, they need policies which encourage more girls to enrol in school and which allow of some flexibility to take into account the seasonal labour responsibility of so many girls in rural areas.[10]

From their national economic orders, and from international economic arrangements, women need not only investment and credit and training but also a fair return for their labours. From the coffee plantations of the Americas to the tea estates of Asia, women work too hard for too long and for too little. To cite one example among a million possible examples, the women workers of Asia's largest textile factory, a subsidiary of an American company, are paid 50 cents per day, rising to 55 cents per day after six years' service (1983 figures). With overtime, those women can earn as much as $16 a month, which is not enough to meet the basic needs of themselves and their families. Each of those women turns out more than one hundred pairs of gloves a day – gloves which are eventually sold in the United States for more than 400 times that woman's daily wage.[11]

There is no justice in this. And although it is sometimes said that economic relationships are not the business of organizations like UNICEF, the day-to-day work of such organizations is constantly bringing them up against the fact that the principal cause of ill health and poor nutrition among the children of such women is that their mothers are overworked and underpaid by the system of economic relationships which now prevails both between and within nations.

A fairer deal in the family

Finally, women need a fairer deal within their own families. In the distribution of food and resources and work, women fare badly in most societies of the world – rich or poor. But in poor societies, it is this unequal load which also deprives so many women of both the time and the energy and the education to improve their own and their children's lives. And the words of Amartya Sen, although written specifically to and for his own society, go to the heart of the matter in countries other than India:-

"Deep-seated inequities persist by making allies out of the deprived – making them a party to the persistence of deprivation. The over-worked family servant, the exploited share-cropper, the debt burdened peasant losing his land to the money lender, have all been traditionally groomed to play these respective roles, and their traditionally unquestioning acceptance of these roles plays an important part in the continuation of these inequities. A sense of legitimacy and order, and one of naturalness, make the inequities entrenched and hard to dislodge.

"While this perception problem is present in the context of very many different types of inequities, it is especially important in the case of within-family distribution. The family is typically seen – with good reasons – as an area of affection, of love, of sacrifice for one another, and no family can work very well without these characteristics. This general element of good sense in the selflessness of family members becomes hopelessly mixed up with the extraction of unequal and unusual sacrifices from women, producing an enormous inequity in the position of women in traditional Indian society. The traditional family is a great compound of warmth, on the one hand, and exploitation, on the other...

"In the field of within-family distribution, the perception of the problem is a crucial part of the problem itself. Non-perception of the deep inequalities that exist reflects the depth of these inequalities as well as serving to sustain them. Role education of boys and girls trains them implicitly for the inequalities of the respective positions.

"It is worth mentioning in this context that the sex inequalities in sustenance and life emerge very clearly in Indian society. It has been observed that girls between the ages of 1 and 5 have a significantly higher mortality rate than boys. The differences in food consumption become particularly sharp in distress situations... There is also much evidence that

the female children receive much less medical attention than the corresponding male children do. Inequalities in the distribution of food within the family fit into this general pattern of relative deprivation.

"The perspective of battles may be very far from the way conflicts of interest in the use of scarce food and other facilities are perceived within the family. But that – if the foregoing analysis is correct – is part of the problem itself, and the first step in changing the objective situation is to make the subjective perception come closer to the observed reality. The placing of women, including little girls, in the position of persistent losers in these battles can be challenged and ultimately countered only by departing from the implicit acceptance of the losing role of the women. A low-key and clinically academic discussion of the problem of intra-family distribution is not quite adequate. We can do with a bit more rage, a bit more passion, a bit more anger." [32]

The self-health potential

If parents can be empowered with new knowledge about child protection – and supported from all sides in the task of putting that knowledge into practice – then it is now possible to halve the rate of child malnutrition and child death in the developing world at a relatively low cost and within a relatively short space of time.

But this extraordinary potential will not be realized if the task is seen simply as the teaching of a new set of techniques or the delivery of a new set of services. Far more fundamentally, the child survival revolution is part of the creation of a new ethic of health care itself.

In recent times, and in almost all societies, even those in which modern medical services are not available to all, health care has come to be thought of only as the curing of illness by medical professionals in hospitals or clinics. In other words, health has become something to be actively delivered by experts and passively received by the laity.

Under such a definition of health care, the present potential for a revolution in child survival and development cannot be realized – whatever the technical breakthroughs at its disposal.

One obvious reason is that modern medical services are not regularly available to the majority of the developing world's families. But an equally important factor is that doctors and hospitals, even if they were available, cannot create anything like as strong a wall of basic protection around a growing child as can be provided by the informed actions of the child's own parents in the child's own home.

Almost all of the most powerful methods now available for protecting children's lives and growth are based on knowledge, decisions, and actions by *parents*:-

Whether a woman will have a little more rest and a little more food in pregnancy; whether she will go for at least one pre-natal check and an anti-tetanus injection; whether her infant will be breast-fed and for how long; when she will begin weaning and with what mix of foods; how and how often to prepare a child's food; whether to pay particular attention to feeding a child during and after an illness; whether to make up and use an oral rehydration solution during episodes of diarrhoea; whether to check the child's weight-gain regularly; whether to take a child on three separate occasions to be immunized; and whether or when to have another child – these are all decisions which have far more effect on whether a child lives or dies, whether a child grows normally or is stunted, than anything a doctor or a hospital can do. And whatever the other influences at play, they are all decisions which are taken and acted on by the family itself.

Dependence on professional medical services is therefore not the child's first line of defence against poor health and poor growth. And only if families and communities come to see themselves as the active promoters of health, and only if parents can again come to see themselves as the most important of all front-line health workers, will present knowledge bring its benefits to the majority of the world's children.

In that sense, the child survival revolution is part of a much wider shift in thinking about health care. World-wide, it is now becoming clear that the next generation of advances in human health will come not via more dependence on medical services but via the return of primary responsibility for health to the individual, the family, and the community.

For the child survival revolution, this change, a change in the conventional wisdom about what constitutes health care and who is to be primarily responsible for providing it, is much more important than any specific breakthrough in knowledge or technique. And it is a change which is now just beginning to become evident in both industrialized and developing nations.

In the industrialized world, many medical professionals see the decades ahead as an "*era in which professional health care providers will play a lessening role in the lives of people while individuals learn increasingly to acquire, develop, and serve as the repository of, information, skills, and community-based resources and supports enabling them to participate more fully in promoting their own health.*"[1]

In the developing world, with its quite different circumstances, several governments are also now pioneering the idea that present knowledge, combined with present communications capacity, can open up the way to much higher standards of health. And it can do so by drastically increasing the power of families themselves to promote their own physical well-being.

That is why "*education concerning prevailing health problems and the methods of preventing and controlling them*" was listed first among eight basic principles which emerged from the International Conference on Primary Health Care held at Alma Ata in the Soviet Union during 1978.[2] And that is why a WHO expert committee, drawn from professors of medicine and directors of health services in both industrialized and developing nations, has recently reported:-

"*The attitude that health care is someone else's responsibility is linked to the fact that, in the past, health professionals have taken away from the people their decision-making power with regard to health. Therefore an effort must now be made to give them back their confidence and to help them develop their skills in making the right choices*".[3]

The returning of primary responsibility for health to the individual and the family is therefore coming to be seen as a more likely avenue to better health in both rich and poor worlds. This report therefore turns now to look at both the potential and the danger inherent in the idea of 'self-health' – a potential and a danger which can most clearly be seen in what is now beginning to happen in the industrialized world itself.

More health at less cost

In the economically advanced nations, it is the soaring cost of health services which has begun to cast a lengthening shadow of doubt about whether more and more medical technology is really the best way forward for human health. Today in the United States, for example, the health industry is the nation's biggest employer, biggest spender, and biggest growth point – costing the nation almost $400,000 million a year, or more than $1,500 per year for every man, woman, and child.[4]

If this colossal expenditure – 25 times as much as in the early 1960s – were rapidly making the United States a healthier nation, then perhaps such a cost would be acceptable. But as one American health educator has written:-

"*What is so disturbing about the high cost of medical care is that despite the largesse we have so eagerly conferred on the development of biomedical research and technology since the 1940s, that investment has largely failed to produce (or at least it is widely thought by the public and many policy-makers to have failed to produce) a return in the*

Bangladesh: visiting 5 million homes

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Oral rehydration worker Krishna Mondul was on her way to the culminating point of another successful household visit when Afia Begum, the woman she thought she had convinced, ran out of the house and away into the village of Shialora.

Mondul, 23, herself village born and bred and a veteran of 10,000 such visits, knew what the problem was. Alone and without the reassurance of her menfolk, Afia Begum had lost her tenuous confidence in the purpose of Krishna's visit. In that moment of crisis, the simple mixing of a pinch of salt with a hand-scoop of molasses and a half litre of water – to treat diarrhoeal dehydration – somehow took on a sinister aspect, and Afia Begum fled.

Not an everyday event but representative of the delicate challenge underlying one of the world's largest and most sustained efforts to put a medical advance into the hands of mothers. It is now five years since the Bangladesh Rural Advancement Committee (BRAC) began to work house to house in Bangladesh. By the end of 1985, their village teams will have visited 5 million of the roughly 16 million households in the country and by the end of the decade, three-quarters of them.

Hard-working young women like Krishna Mondul are the backbone of the effort, teaching mothers in 30 minutes why and how to treat diarrhoea with household salt and molasses. Tight monitoring later tests mothers on overall understanding and on how accurately they can mix the solution (the oral rehydration workers are remunerated accordingly).

The effort itself has learned from experience as the village teams (some 1,000 men and women by late 1985) fed back the lessons from the accumulation of individual encounters, some 150,000 a month.

Most important among these lessons was the realization that getting most people to actually use the rehydration solution would take more than mothers and more than one visit.

To really work, the campaign had to involve the whole community, not just in advocacy and demonstration but in discussion, debate and – wherever possible – treatment. Visits to individual households had to be reinforced by meetings with men, particularly community opinion-leaders. In 10% of districts, special teams stay for six months to tackle public health issues, to teach the importance of breast-milk colostrum in the first days of life and proper weaning after the first four months, and to engage the health care 'establishment' (doctors, traditional healers and midwives) – including training women from the community as health educators and promoters. Special efforts are made to involve schoolchildren and teachers.

At first many are sceptical. Why come all the way to see them with nothing more substantial than information? BRAC is pragmatic: if it were not so important, why would they and the government invest so much time and money? "*We are all poor,*" BRAC workers tell their clients. "*This is a way of saving not just money for medicines but maybe even a child's life.*"

Krishna Mondul knows the link between fear and ignorance and dependence. She went back to Afia Begum, calmed her fears and finished training her to mix the oral rehydration solution. "*I knew that without the practical part, the theory I had given her would be meaningless,*" she said. "*Knowing the practical mixing for herself, she would not need to call anyone else for help; she could even teach others.*"

form of a reduction in morbidity and mortality that can be considered proportionate to our investment. This failure of costly, high-technology disease treatment has, in turn, focused recent interest on promoting health and preventing disease in order to reduce the costly burden of premature death and disability".[5]

Looking at alternative approaches, the same writer concludes: "*central to most of these alternatives is the return of primary responsibility for health to the individual, the family, and the community*".

A similar concern is also mounting on the other side of the Atlantic. This year, for example, Dr. Jurg Sommer of Basle University Teaching Hospital in Switzerland has written:-

"*... a review of the literature reveals little evidence that further investments in medical services in developed countries will lead to any marked reductions in overall mortality and morbidity rates. The per capita expenditures for health care among Western nations vary by more than 200% but most of their health indices vary by less than 5% and there is little correlation between the two. Once a reasonable minimum of medical care has been provided, factors other than medical care – diet, life-style, heredity, environment – appear to have a much larger effect on health and longevity than does more medical care. Yet Switzerland is currently investing an additional 1.5 billion Swiss francs every year in medical care.*"[6]

Faced with the evidence of rising costs and diminishing returns from increasing dependence on medical services, the industrialized world is beginning to experiment with the opportunity for 'more health at less cost'. In the Soviet Union, for example, a $500 million mass-media campaign has just been launched to educate the public in healthier behaviour – concentrating on better diets, less alcohol, more exercise, and regular physical check-ups. And in New York City, the Department of Health has announced an attempt to cut the city's infant mortality rate by 20% before the end of 1988 – mainly by means of a mass-media public education campaign and a preventive programme to try to reduce the incidence of low birth-weight among the poorest of New York's mothers.[7]

With the possible exception of the Scandinavians, the governments of the industrialized nations are not yet going into action on a scale which matches this opportunity. The United Kingdom and the United States, for example, are still devoting much less than 2% of government health spending to the prevention of disease and the promotion of health.

Yet the economic sense of the new approach is reflected in the more immediate response of the business world. In recent years, at least 50,000 American corporations have started some kind of active programme to inform and support their employees in taking better care of their own health.[8] One company's programme to provide the time and facilities for employees to take regular exercise has resulted in 36% lower health care costs. Another company's 'wellness' programme found that those with 'unhealthy life-styles' were 86% more likely to be off work on any given day. Another found a 26% reduction in high blood pressure among employees after a company started an employee 'Live for Life' programme. In several such programmes, the health costs of employees who do not smoke have been found to be 30% to 50% lower.*[9]

Blaming the victim

The early results of these new approaches confirm their potential. Changes in eating habits in the United States, to take just one example, have already helped to reduce deaths from heart disease by approximately one-third.[10] And it is now thought possible that a change towards healthier life-styles could push average life expectancy in the industrialized world to well over 80 years for both men and women – something that doubling and trebling today's vast expenditures on medical services could not hope to do. According to the Centers for Disease Control in the

* Whether in a country or a company, poor health is poor economics. Illness loses American corporations over 400 million working days a year – and costs approximately $40,000 million. In addition, actual spending on the health of employees is becoming a major factor in production costs: $500 of the purchase price of every General Motors car, for example, is now allocated to medical costs for General Motors' employees.

United States, for example, the average American male can achieve an 11-year increase in life expectancy by four basic self-health actions – not smoking, drinking only in moderation, taking regular exercise, and eating wisely in both quantity and quality.

Excitement about the present potential for preventive and promotive 'self-health care' in the industrialized world is therefore justifiable.

But every silver lining has its cloud. And in this case the cloud is that putting all the emphasis on life-styles and individual responsibility for health could also be used as a way of taking the emphasis away from the political, social, and economic causes of ill health which are largely beyond the control of the individual but which profoundly influence the individual's life-style.

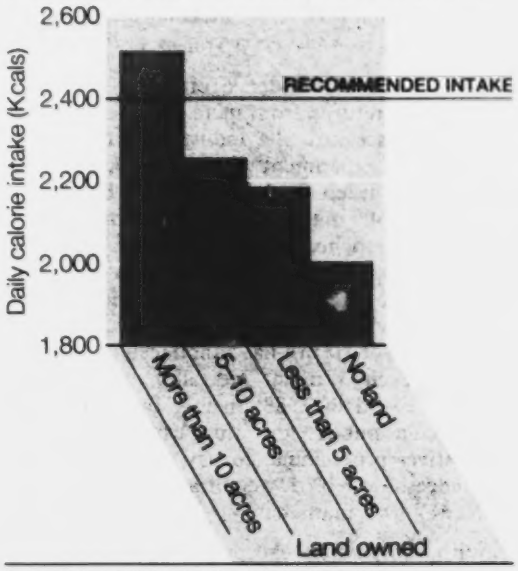
In all societies, the one element of life-style which is likely to make most difference to a family's health is a family's wealth (Fig. 13). In rural Bangladesh, the infant mortality rate is twice as high among the families of those who own no land. In Manhattan, the infant mortality rate is twice as high among families who live north of 125th Street. In 19th-century Europe, the infant mortality rate in the slums was around 200 deaths per 1,000 babies: in the royal families of 19th-century Europe, the infant mortality rate was about 12 deaths per 1,000 babies – almost as low as in the most medically advanced country in the world today.[11]

So if the drive for better health is to take the road of changes in the life-style of the individual, then it must confront the fact that many of the industrialized world's families are living unhealthy life-styles primarily because they are poor. And at that point, it becomes obvious that employment policies, housing policies, and basic government services must also be part of any policy which seeks to improve health by changing the circumstances under which individuals live their lives. In the United States, for example, it would be a perversion of the great potential for 'self-health' to ignore the conclusion of this year's report to the New York Community Service Society, which pointed out that the number of children living in poverty was probably "*well over the 40 percent mark*".

Similarly, the attempt to prevent illness by educating the public in the direction of better health habits cannot ignore commercial forces which may help to shape or reinforce behaviour conducive to poorer health. Stopping smoking, for example, may do more for an individual's health than any amount of complex medical technology: but is it entirely fair to place all the responsibility on the individual in a society which spends over 100 times as much on advertising tobacco as it does on educating the public about its dangers?[12]

Without doubt, informed action by individuals and families in taking primary responsibility for their own health now offers far more opportunity for advances in human health than further spending on, and advances in, curative medical technologies. But that does not mean that responsibility can be abrogated by those governmental or commercial forces whose actions help to shape the circumstances of the individual and the family. Or as Dr. John Allegrante, Director of the Center for Health Promotion at Columbia University, has put it:-

Fig. 13 Ownership of land and daily intake of food, Maharashtra, India, 1982



Source: National Institute of Nutrition, Hyderabad, India, 1982.

"...many of our recent efforts in the implementation of national policy in health promotion and disease prevention have been efforts that have abrogated our moral responsibility to provide the social and economic supports for necessary organizational and environmental changes. So, while we may have been thinking that our national health policy and our own local efforts at promoting health by teaching that individuals ought to do more for themselves, by themselves, may be more humane, cost-effective, and socially acceptable than more costly technologies like medical care or coercive means like punitive legislation that compels change, I am left only to argue that government must not abandon the role it has played in regulating the marketplace and subsidizing social conditions that facilitate or support behaviors thought to be conducive to health. This is, I believe, the single most important moral issue facing those of us who use health education as a technology in our attempts to prevent disease."[13]

The responsibility of governments

In the developing world, the need and the potential for individuals and communities to take more control over their own health is even greater. External medical services are very much less available. Levels of family health are generally much lower. And many of the most basic problems are more susceptible to action by families and parents than by doctors and hospitals.

In particular, present knowledge, and present capacity to communicate that knowledge, add up to the possibility of a quite drastic improvement in the capacity of poor families to protect the lives and normal growth of their children.

But as in the industrialized world, this opportunity is shadowed by the danger that 'families doing more' might be interpreted as 'governments doing less'. For among the basic elements of 'lifestyle' in the poor world which contribute to poor health are the lack of clean water, safe sanitation, decent housing, basic education, land reforms, adequate incomes. And the prevention of ill health is therefore a responsibility not just of individuals and families but of governments and the international community.

In other words, there is all the difference in the world between a policy which uses the vast potential for 'self-health' as an excuse to pass on the responsibility for poverty and sickness to the poor and the sick, and a policy which uses all the resources of a nation to inform and support the majority of its people in the task of improving their own health by their own actions.

Families need the support of new knowledge about low-cost ways of protecting life and growth and health. But they also need the support of community health workers to reinforce that knowledge and to act as a channel for referring more complicated illnesses to more specialized services. And from governments and the international community, they need the support of development programmes which set the provision of basic services – water, sanitation, education, housing, land, jobs – at the centre of their sights and not at the periphery of their vision.

With this kind of support, informed action by families could now be a beginning not just of a rise in the level of health but of a rise in a community's consciousness and confidence that it can take more control over its own circumstances by its own actions. And that is a process which is both a means and an end of development itself.

Self-health in poor communities

'Self-health' is therefore an idea which poor communities are to be supported in rather than abandoned to. But this does not alter the fact that the majority of the world's poor families will remain poor for some time to come. And protecting the growing minds and bodies of young children from the worst effects of that poverty is essential to the breaking of the cycle by which poverty itself is perpetuated. This report therefore turns now to a more detailed look at the potential of present knowledge for empowering and supporting parents themselves to protect the lives and normal growth of their children.

What are the poor world's equivalents of the facts about heart disease, stroke, cancer, diet, smoking, exercise, cholesterol levels, blood pressure – facts which are now permeating public consciousness in the industrialized world? What

Nigeria: going nation-wide

17

Between August 1983 and August 1984, immunization of children under two leapt from 9% to 83% in the Owo area of Ondo state, Nigeria, with little rise in costs. In October 1984 Nigeria's head of state pledged free vaccine to every state adopting the new approach. By August 1985, all of Nigeria's 19 states had taken up the challenge in 38 local government areas, which house a sixth of the country's 7 million children under two.

To take only measles, easily the principal killer of Nigerian children, the cases reported at a major hospital in Owo had fallen by 93% in August 1985. Experts from the Centers for Disease Control, USA, estimate that the immunization drive in Owo has forestalled 10,000 cases of measles, prevented over 300 deaths and saved at least 150 children from blindness, deafness or other disabilities.

The Owo approach ensures that vaccines are available and that parents are aware of the benefits of vaccination. Since power supply for refrigerating vaccine is unreliable in outlying areas, vaccines are moved swiftly in and out from a central depot in styrofoam cold boxes, which can keep vaccines at the right temperature for over a week. To make it easier for parents to bring their children for vaccination, temporary vaccination posts are set up in market-places, schools, mosques, churches and village halls. And to ensure that parents understand the need for vaccination, the community leaders, traditional chiefs, religious leaders and schoolteachers are called on to add their authority and backing to the posters, flyers, radio messages, songs, house-to-house visits and loudspeaker vans which publicize the vaccination sessions.

The cost: between $4 and $5 for each child completing the five visits needed for full protection against the main killer diseases of childhood.

Early returns in 1985 showed that the new approach was already increasing the numbers of vaccinations eightfold and tenfold compared with 1984. The cold boxes are now moving out into neighbouring areas. In two years' time, they are due to reach every village in the country.

Given Nigeria's steep falls in oil revenue and heavy debt, most states have established 'partners in health' committees to draw on every available resource. Rotary International is supplying polio vaccine for five years; Rotary clubs, the Paediatrics Association of Nigeria, the National Association of Nurses and Midwives, and the National Council of Women's Societies are all lending their support.

The enthusiasm for vaccination has proved easier to generate than to sustain. Even in Owo the coverage for measles, the last shot in the series, had slumped to 50% in May 1985, raising the threat of an epidemic before year's end. So Owo again became a testing-ground. Community education efforts were intensified, and mothers whose children complete the course now receive a 'good mother' certificate. By August, measles immunization in Owo had climbed back to 75%.

The drive to make vaccination available to every child in Nigeria has gone hand in hand with the promotion of oral rehydration, to prevent the diarrhoeal dehydration which currently kills 500 of the country's children every day. The first demonstration unit for oral rehydration opened its doors at Massey Street Children's Hospital, Lagos, on 5 February 1985. In its first six months the unit treated 2,000 children, and only three children died, compared with the 1984 average of 19 deaths a month. The hospital also saved over $40,000 on the costs of intravenous rehydration. All of the nation's states have now set up similar units, to promote oral rehydration to health workers and public alike, and at least one unit is planned for each of Nigeria's 304 local government areas in 1986.

are the corresponding breakthroughs in knowledge which can help families to prevent or treat the major causes of death and illness among the developing world's children – the respiratory infections, the diarrhoeal illnesses, the communicable diseases, the poor nutritional health?

The problems and possible solutions vary from community to community, country to country. But there is a core of basic low-cost 'self-health' actions which have almost universal relevance and which depend far more on parents than on doctors. And *together*, they are powerful enough to reduce by as much as *half* the incidence of malnutrition, illness, and early death, among the children of the developing world.

Strategies which are already going into action around the world, such as ORT and accelerated immunization, have already been touched upon. Others, which could be equally important, are not yet widely enough known.

For those readers who are not professionally involved in health care, it may therefore be useful to summarize those strategies – and the relationship between them.

And as the only true importance of such knowledge rests in it being put at the disposal of parents, this brief account makes no apology for stripping that knowledge of its medical vocabulary:-

Action in pregnancy

A child's nutritional health begins not at birth but at conception (and can be significantly affected by the nutritional well-being of the mother during her own childhood and adolescence). The first vital actions for protecting children are therefore to be taken before and during pregnancy. And present knowledge suggests three basic actions which many poor families might be able to take – if they had the necessary information and support:-

○ It is now known that becoming pregnant again soon after giving birth roughly doubles the risk to the life and health of both mother and children.[14] To protect both, there should be a space of at least two or three years between one birth and the next (Fig. 14).

○ It is also known that too little food and too much hard physical work in pregnancy are seriously damaging to a woman's health – and seriously increase the risk that a baby will not grow properly inside the womb. If the result is that the baby's weight at birth is less than normal (i.e. lower than 2,500 grammes), then the risk of death in infancy is roughly doubled.[15] Even a handful of extra food each day of the pregnancy, and a half-hour's extra rest, can make a significant difference.[16]

○ It is also known that immunizing the mother against tetanus in pregnancy automatically immunizes the unborn child. If a community knows the importance of ensuring that a pregnant woman receives two anti-tetanus injections, and if basic health services are within reach, then approximately 800,000 infant lives a year can be saved.[17] If immunization against tetanus is just not possible, then the presence of a trained person at the birth – someone who knows the importance of clean hands, a clean delivery sheet, and the hygienic cutting and dressing of the umbilical cord – is almost as effective in protecting the child against the disease.[18]

Breast-feeding

For the first few months of a child's life, the best possible protection which any mother can provide for the baby's normal health and growth is exclusive breast-feeding (Fig. 12).

It is now known that breast-milk contains at least six anti-infective agents against some of the most common illnesses of infancy.[19] It is also the most nutritious and hygienic food which any baby can be given.

Bottle-feeding, by contrast, frequently means that a baby is fed on a less nutritious artificial formula which may well be over-diluted with unclean water in an unsterile bottle.[20]

In other words, breast-feeding mitigates the risks of poverty and poor hygiene while bottle-feeding exacerbates those risks (Fig. 15). And in dozens of surveys in poor communities, it has now

Sri Lanka: reaching the poorest

Sri Lanka ranks alongside China in showing that a country need not be rich to increase its children's chances of survival. Despite an average capita income of little more than $300 a year, Sri Lanka has brought its infant mortality below 40 deaths per 1,000 live births; 86% of the population is literate, and on average, 65% of one-year-olds are fully immunized. In September 1985 Sri Lanka took up the challenge of bringing immunization to the remaining third of its children – the hardest to reach – within a year.

Long-standing commitments to free education, free medical care and food subsidies for those in need lie at the heart of Sri Lanka's achievements over the years. Even so, an estimated quarter of all babies are born underweight, with the attendant risks of sickness and death, while some 45% of Sri Lanka's 2 million children under five are malnourished to some degree. Diarrhoea kills over 2,000 Sri Lankan children a year and undermines the nutritional status of many thousands more.

○ Since 1978, when Sri Lanka launched its expanded immunization programme, the incidence of polio and whooping cough has gone down by 65% and the incidence of diphtheria and neonatal tetanus by 90%. Over its one-year term, the new accelerated programme is designed to lay a permanent base for full vaccination of all the country's children well before 1990.

○ The national diarrhoea control programme, which reached more than a third of the population by the end of 1984 and was due to achieve national coverage by the end of 1985, stresses traditional remedies available in even the poorest homes, such as rice congee (gruel), to prevent dehydration before it starts. The government manufactures oral rehydration salts for children who need further treatment. Previously obtainable only from midwives and health centres, the salts are now available from pharmacies and general practitioners as well, and from early 1986 on will be sold by more than 10,000 retail outlets.

○ Sri Lanka has used the growth monitoring technique since 1975 to identify malnourished children for supplementary feeding. A new growth chart for mothers to keep at home was tried out in 1984 and is now being introduced nationally.

○ To counter the drift towards bottle-feeding in urban areas, where 25% of working mothers stop breast-feeding before three months, the government enforces a recent law banning the advertising of breast-milk substitutes. Maternity leave for working mothers has been doubled to three months to encourage breast-feeding.

Volunteers play a key role in Sri Lanka's attempts to achieve universal coverage. More than 10,000 young health volunteers assist midwives in their villages and some 4,000 staff of the Sarvodaya Shramadana village development movement are working towards child survival in 3,000 villages. Many of Sri Lanka's 19,000 Buddhist priests are also promoting child well-being. The Saukyadana medical volunteer movement, Sri Lanka Red Cross, Boy Scouts and Girl Guides, Lions clubs and Rotary clubs are all actively involved.

To raise parents' awareness of ways to improve their children's chances of survival and healthy development, the national broadcasting network gives free air-time; newspapers and magazines run regular features; private companies print child survival messages on pay slips, carrier bags, envelopes and exercise books. And in September 1985, the Indian and Sri Lankan national cricket teams agreed to have the message "Immunize your child today" painted in metre-high white letters on the pitch used for the Test Match – and watched by a television audience of tens of millions in both Sri Lanka and neighbouring India.

The effect of these measures will eventually be revealed by a new system for monitoring child survival and development. Taking a national sample of over 15,000 pregnant women, the system will follow their progress – and that of their children – for the next five years.

been shown that bottle-fed babies are as much as *two or three times* more likely to die in infancy than babies who are exclusively breast-fed for the first few months of life.[21]

Applying this knowledge can bring the majority of children in poor communities to the age of five or six months in good nutritional health. So far, the infant has been at least partly insulated from poverty by the womb and the breast.

But for millions of the poor world's children, it is now that the trouble begins. For now the child begins to come into increasing contact with the environment of poverty – a poverty which begins to gnaw at normal health and growth. It is at this point that the terrible 'growth gap' begins to open up between the smooth upward progress of children in affluent communities and the sudden weight losses, frequent illnesses, and faltering growth of children who grow up in poorer communities.

It is also at this point that one of the least understood and most important of all low-cost child protection strategies could begin to play its vital part. And because it can serve as a means and an aim and a measure of almost all the other low-cost actions which parents might take to protect their children in these vital, vulnerable years of growth, the strategy of ***regular growth checking*** deserves a more detailed consideration.

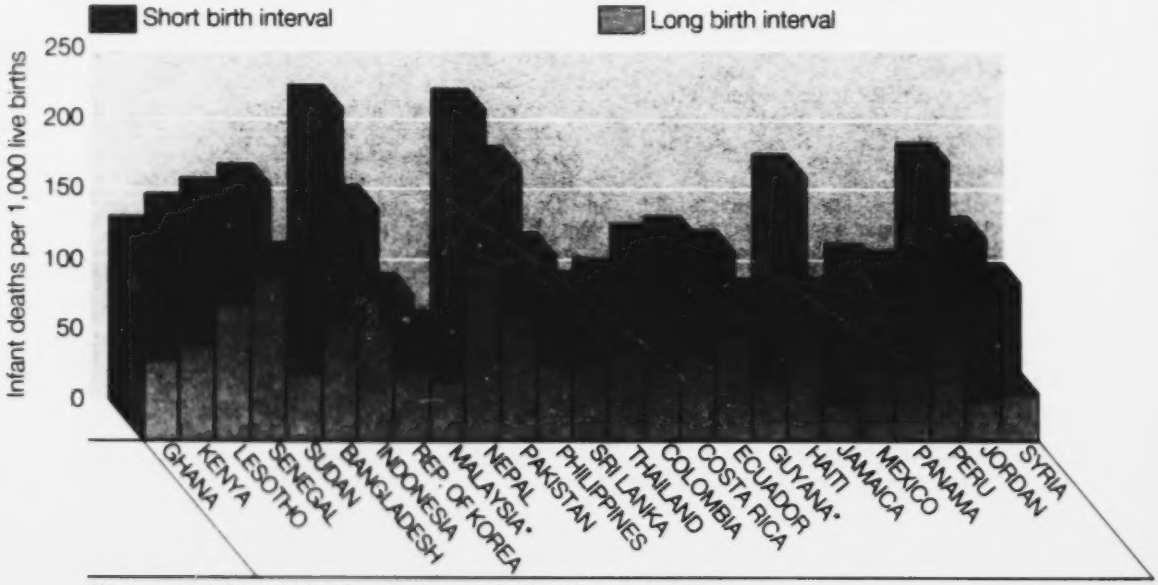
Protecting growth

The most insidious aspect of child malnutrition is that most mothers do not know that there is anything wrong.[22] And the very fact that the development of malnutrition is invisible – even to paediatricians and even to parents – is one of the main reasons for its prevalence and severity.

In most cases, no-one ever notices the lack of adequate weight gain, and the child simply lives

Fig. 14 Infant deaths by birth interval, uneducated mothers, 25 countries

Infant death rates for those born after short (less than 2 years) and long (2–6 years) birth intervals. To minimise social and economic differences, the following figures apply only to mothers with no formal education.



*Women with 1–3 years education used because too few with no education

Source: Population Reports, Series J, number 27, May–June 1984

Haiti: ORT reaches the majority

In less than a year, a campaign to promote oral rehydration therapy has succeeded in putting this scientific breakthrough into the hands of the majority of parents in one of the least likely of settings – the Caribbean island of Haiti.

Haiti has long been one of the poorest and least healthy countries in the Western hemisphere, with an infant mortality rate of 128 deaths per 1,000 live births and an average life expectancy of only 53 years. The annual health budget – about $3.50 per head – fell far short of the needs, so in 1982 Haiti's health planners shifted their approach: they would attack one problem at a time. Diarrhoea stood out as the largest killer, accounting for half of all deaths of infants and children; and a low-cost solution was available.

Oral rehydration therapy (ORT), the best and cheapest way to forestall diarrhoeal dehydration, was known in Haiti but rarely used. Between 1980 and 1982 Dr. Jean Pape and his colleagues at Haiti's State University Hospital had used ORT to reduce diarrhoea mortality in the children's wards from 35% to under 1%; but this dramatic confirmation of the value of ORT received more recognition outside Haiti than at home.

In late 1982 the tide turned. The Minister of Health called upon his staff and all other branches of government to help make ORT available to everyone in Haiti. Nine months later, in July 1983, the national ORT programme was launched.

During the following year over 6,000 health and other personnel were trained in how to use ORT and how to teach others to use it. Serum Oral, the locally manufactured brand of oral rehydration salts, was advertised on radio and television nation-wide; half a million flyers were posted on walls and given to schoolchildren. Starter supplies of Serum Oral were issued free to the more than 2,000 shops, stalls and roadside stands willing to sell it. Rehydration corners were set up in 250 public health clinics and some 200 private clinics to demonstrate Serum Oral to the public. Popular jingles were broadcast up to twelve times a day on the radio, making Serum Oral a household word.

Within a year, country-wide surveys found that more than three-quarters of mothers knew about Serum Oral, and a third had used it for their child's most recent diarrhoea episode.

In the slums of the capital, Port-au-Prince, a survey in April 1985 found that over 90% of mothers knew about Serum Oral; 49% had learned of it from radio or television and 39% from health centres. Even more important, 80% had used it for their child's latest diarrhoea episode and planned to continue using it, in spite of the fact that nearly half of them were paying more than the official price of 75 centimes a packet (15 US cents).

Admissions for diarrhoea to Port-au-Prince city hospital, once more than 5,000 patients a year, have dropped to less than half. Over two-thirds of the children coming in have already started oral rehydration at home, so that even in severe cases the medical care is more effective and the death rate has plummeted.

Public enthusiasm for ORT has grown so strong that the country's educators have altered the thrust of the national literacy campaign; it now concentrates on health messages as the surest way to attract greater interest and participation, especially from women.

The work continues to take ORT into the remotest mountain areas of Haiti. Meanwhile, Haiti's planners are now turning their sights to the next goal – using schoolchildren, radio, television and every possible means of communication to raise Haiti's level of child immunization from less than 10% to 50% within a year.

on with poor growth and frequent illnesses. In a minority of cases, the problem of malnutrition does eventually become visible – but by that point growth is already seriously affected and the task of putting the child back on course has become very much more difficult and very much more expensive.[23]

Prevention is usually possible if parents understand the importance of growth and can somehow measure it, see it, and take action to maintain it. And if any faltering in growth could somehow be seen at a much earlier stage, then there are now several relatively simple and relatively low-cost actions which poor parents can take to keep the child on course and prevent serious malnutrition from settling in. And therein lies the importance of regular monthly weighing.

The details of the growth monitoring process are brought together in Part II of this report (see Lifelines: growth monitoring). But the essence of the idea is that regular monthly weight gain is the best single indicator of any child's normal growth and that the process of regularly recording that weight gain, or the lack of it, is an essential technological aid to the mother in doing what she is trying to do anyway – bring up a healthy, well-nourished child in very difficult circumstances.

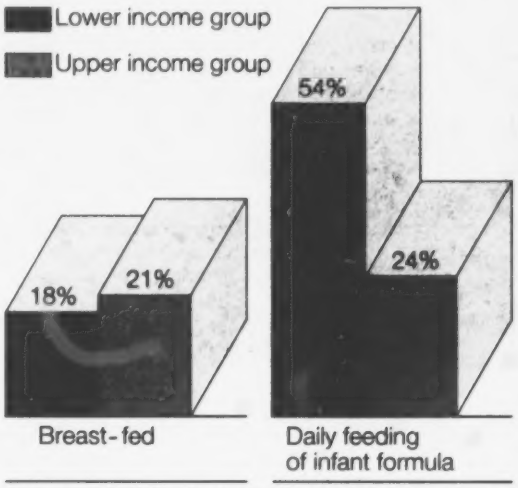
Simple as it may seem, the growth checking idea is beset by unanswered questions – questions about the right kinds of growth charts and weighing scales to use, about how the regular weighing of all young children is best promoted and organized, about whether graphing growth is too alien a concept for mothers who may well be illiterate, and above all about how to inform and involve millions of mothers in the process.[24]

But the stakes are high. For there is reason to believe that if parents could be involved in and informed by the regular growth checking of their children, then child malnutrition could be reduced by as much as half in the poor communities of the developing world.

The heart of the matter is the informed involvement of the mother. For the mother's participation in regular growth checking means

Fig. 15 Diarrhoeal illness by feeding method and income, Dar-es-Salaam

Percentage of families reporting infant diarrhoea in the three months prior to the survey.



Source: International Union of Nutrition Scientists, Ad Hoc Task Force on Rethinking Infant Nutrition Policies, March, 1982

that the normal development of the child, or the lack of it, can be made visible to the one person who cares most and can do most to make sure that the child grows and develops normally.

But in itself, growth checking neither feeds children nor protects them from disease. Therefore its only true value resides in what *action* parents take as a result of getting much more timely and precise information about the nutritional status of their children.

The detailed actions which any particular parent can take are, of course, prescribed by local circumstance. But recent advances in knowledge have shown that there are certain kinds of low-cost action which most parents could take to provide basic protection for *growth*.

That knowledge can broadly be divided into knowledge about the special nutritional needs of the young child and knowledge about reducing the frequency and severity of illness:-

India: towards a polio-free Madras

20

As India prepares to attempt the immunization of all its children by 1990, smaller-scale programmes are yielding valuable experience of how to involve all organized resources in reaching out to the poorest groups. This year, one such campaign has also succeeded in controlling one major disease in one major city.

This year the city of Madras made an unprecedented attempt to contain polio by immunizing the vast majority of its children. Without this extraordinary effort, as many as 1,000 of the city's children would have been permanently crippled by polio in the next twelve months alone.

What became known as the 'Madras momentum' started in 1984 as a collaboration between the state government of Tamil Nadu and Project Impact – a coalition of organizations working to prevent disability.

After two pilot campaigns in slum areas, a city-wide programme was mapped out for early 1985. The first task was to stock up on oral polio vaccine. With help from Indian businesses, Rotary International and the United Kingdom Save the Children Fund, the state ministry of health accumulated the necessary 600,000 doses during the early months of the year. To keep the vaccine cool until it was needed, three private companies volunteered their refrigerated storage space.

But as the pilot campaigns had shown, organizing the supply of immunization is often an easier task than organizing the demand. The next step was to inform all Madras parents of the three vaccination days and their importance.

First the slum-dwellers' own community leaders were asked for their advice and help. Volunteers were recruited and the plans drawn up to visit each of the city's 1 million homes. On average, there was one vaccine centre for every five streets.

Among the volunteer organizers were school-children, teachers, university and medical college students, local officials, child care workers, members of the Lions and Rotary clubs, and members of the general public. Touring films on polio were shown to thousands of slum-dwellers. The national radio and television networks ran advertisements, documentaries and panel programmes. Fleets of motor-driven rickshaws with megaphones toured the narrow streets announcing the vaccination days. A million handbills went up throughout the city. And on the streets, traditional puppet shows dramatized the war between polio and vaccine.

The Madras business community supplied ingenuity as well as cash to back up the campaign. Employees received notices in their pay packets stressing the importance of immunization, asking them to spread the message to friends and neighbours, and appealing for donations: the results were pinned up on company notice-boards. Immunization stickers were placed on telephone handsets in hundreds of small hotels and restaurants, which also offered their refrigerators for local storage of vaccine on immunization days. A vaccination 'advertisement' was rubber-stamped on outgoing mail in hundreds of commercial offices.

Between May and July, the majority of the city's children were immunized against polio, despite some falling-off in attendance. Even so, 94% of the city's children received the first dose, 88% the second, and 72% the third – a coverage level that may be high enough to interrupt the transmission pattern of the disease and so protect even those who were not immunized.

Successful as it was, the Madras initiative raises the questions of how to sustain such initiatives year by year and how to reach children under one, the most vulnerable group. The campaign also tackled only one of the six vaccine-preventable diseases that strike at children's well-being. But as the project newsletter Moksha comments, "The creation, on a mass scale, of public awareness of the importance of immunization will further strengthen the existing expanded programme of immunization."

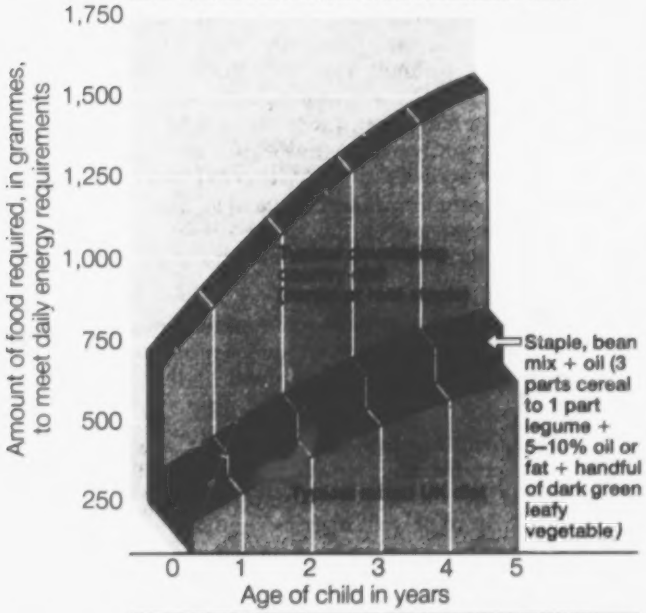
Improving diets

One of the most common reasons for the faltering of a young child's growth is that the introduction of other foods, in addition to breast-milk, begins too late.

After about five months, breast-milk alone is no longer sufficient and other foods must be added if the child is not to become malnourished. Yet in many parts of the world, other foods are not introduced until the child is well into the second six months of life and, for many, a whole year goes by before any other food is taken. In rural India, for example, an estimated 40% of all infants are still being exclusively breast-fed at the age of one year.[25]

Fig. 16 Energy content of children's diets, rich and poor nations

The graph shows the amount, by weight, of the food which must be eaten each day to satisfy the energy requirements of growing children – at different ages. In the developing world, a diet including a staple plus some vegetables and some oil increases the energy density of a child's food to almost the same level as that of a child in the industrialized world.



Source: Adapted from: Dietary fats and oils in human nutrition, Food and Agricultural Organization of the United Nations, Rome, 1977.

At the other extreme, the introduction of other foods at too early an age steeply and unnecessarily increases the risk of diarrhoeal and other infections.

Present knowledge about when to begin weaning could therefore help mothers avoid one of the major causes of faltering growth.

Just as important is the question of how a child should be weaned:-

In a poor community, the attempt to wean a child on nothing but the same staple food as adults is likely to lead directly to malnutrition. For a child's small stomach cannot take enough of the bulky, low-energy foods which are the staple diet of the poor (Fig. 16). The child may well eat enough to satisfy its hunger and be said to have 'eaten a good meal'. But it will not have eaten enough to meet its energy requirements for normal health and growth.[26]

The staple foods of the poor, unlike those of the rich, therefore carry a built-in danger of child malnutrition (Fig. 16). To counter that danger, a child has to be fed at more frequent intervals with more energy-dense foods. In practice, that means mixing fats and oils, and peeled and mashed vegetables, into the child's weaning food. And it also means continuing with one of the most energy-dense foods of all – breast-milk (Fig. 17).

Finally, there is the recent breakthrough in knowledge about the importance of vitamin A (see page 22). In practice, that breakthrough means that a daily handful of the cheapest dark-green leafy vegetables can help both to protect the child's eyesight and to reduce the number of diarrhoeal and respiratory infections which a child sustains.

Empowering parents with this vital knowledge about the special nutritional needs of the weanling child – in terms which parents can understand and act on – could therefore reduce malnutrition and help to maintain growth.

But in almost all cases, the oils, fats, and even cheap vegetables will mean at least a little more expense. The very poorest families will therefore not be able to make these small but vital improvements to their children's diet. And for

such families, only the struggle for social justice and economic improvement can improve their children's chances of normal development.

But it is now known that a significant percentage of the world's malnourished children live in homes where there *is* enough food to provide an adequate diet for a young child. In a recent nation-wide survey in Indonesia, for example, no discernible difference was found in the amount or kind of food available in the homes of children who were malnourished and the homes of those who were not.[27]

In this circumstance, present knowledge about when and how to wean a young child could reduce both the incidence and the severity of child malnutrition – *if* that knowledge were to be made widely available.

But diet is not all. What the child's body does with the food that is eaten is just as important as food itself. And in recent years, evidence has been accumulating behind the idea that a poor intake of food may not be the only or even the main cause of child malnutrition.

Reducing illnesses

One of the most important of all recent advances in knowledge about child health is the realization that frequent infection is as important a cause of malnutrition as the lack of food itself.[28]

To fight an illness, a child's body requires extra energy. But illness usually means a loss of appetite – so the body receives less energy, not more. Usually, the illness itself also means that less of the food that is eaten is absorbed and available for growth. And if the illness involves diarrhoea, then nutrients are also drained out from the body. At the same time, the reaction of most parents (often encouraged by doctors) is to withhold food and drink. In all of these ways, the child's nutritional stock may be severely and frequently depleted by illness. The result can be malnutrition and poor growth – *even if adequate food is available in the home.*[29]

Many detailed studies have now demonstrated this causal relationship between illness and malnutrition, and research in Asia has suggested that diarrhoeal disease alone is responsible for between 25% and 75% of growth faltering among the children of poor families.[30]

The real problem is therefore not either malnutrition or infection but both – as malnutrition itself predisposes the child to some infections which lead to further nutritional depletion. Or as Hossein Ghassemi has written: "*Poor diet and infection have synergistic effects in precipitating malnutrition among children, and by the same rule, simultaneous control of infection and improvements in a child's diet would have a synergistic result in improving its chances of survival*".[31]

While doing what is now possible to improve diets, and especially weaning diets, what then are the low-cost actions which parents can take to reduce illness?

Protection against diarrhoeal illness

The most common of all childhood illnesses is diarrhoeal disease. In very poor communities, for example, a child may contract a diarrhoeal infection perhaps six or more times a year – with each episode lasting for several days. If the response of the parents is to withhold food and drink, then diarrhoea may mean that a growing child is losing rather than absorbing nourishment for a total of up to 40 days in the year. And that alone is enough to cause normal growth to falter.[32] That is why many nutritionists now believe that diarrhoeal infection is one of the major causes of childhood malnutrition in the developing world today.[33]

So what can parents in poor communities now do to ward off this, the greatest threat of all to both the lives and the normal growth of their children?

More frequent handwashing with soap and water, and more hygienic ways of preparing and storing food, are the two main ways in which parents can help to prevent diarrhoeal disease – if they have adequate supplies of soap, water, fuel, and time.[34]

But for the most part, prevention depends on improved incomes and living conditions, safer

sanitation and water supply, and a general rise in the level of health education.* In other words, prevention is related to basic changes in public health which are, in turn, closely related to the overall level of economic development. And to leave the control of diarrhoeal disease to the gradual and fitful process of economic growth means leaving 4 million young children to die each year – and many millions more to live on in malnutrition – until well into the next century.

There is now no excuse for allowing that to happen. For the discovery of oral rehydration therapy, touched upon at the beginning of this report, means that there is now a cheap and simple method by which all parents – rich or poor – can protect their children from the worst effects of diarrhoeal disease.

In previous years, this report has documented the fact that parents themselves can make and use oral rehydration solutions and help to save the lives of most of the 4 million children who now die each year from diarrhoeal dehydration.

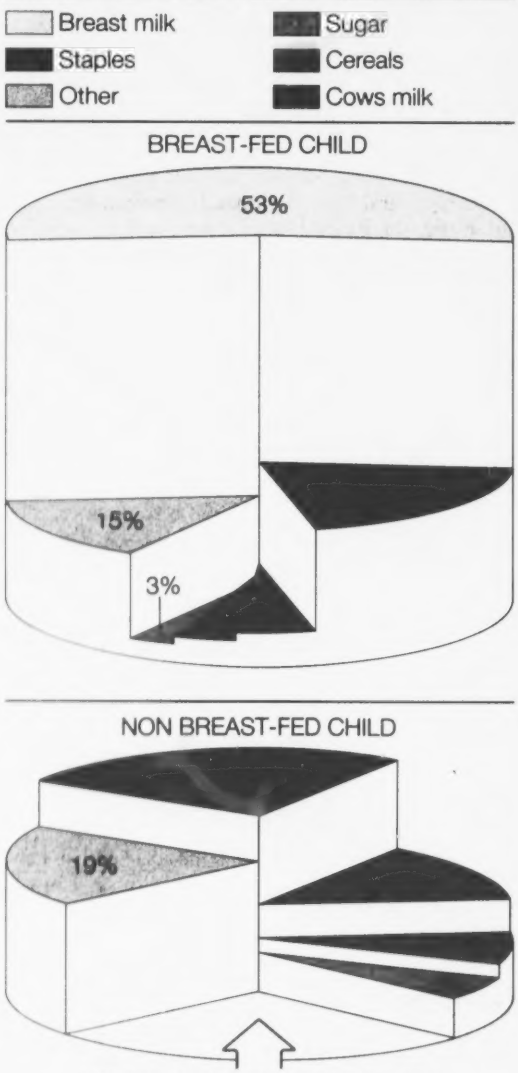
But ORT has a less spectacular side to its nature. Even for those children whose lives are not directly threatened by dehydration, ORT could become one of the most incisive of tools for cutting into the cycle of infection and malnutrition which now holds back their growth.

The first and most basic element of ORT has nothing to do with technology or special formulas or foil-wrapped sachets. It has to do with informing parents that it is important to persist in giving a child food and fluids during an episode of diarrhoea.**

Continuing to feed, and especially to breast-feed, is therefore the beginning of ORT. It helps to prevent dehydration. It helps to prevent the

Fig. 17 Breast-feeding and calorie intake in the second year of life

Percentage and source of calories in the second year of life, Uganda.



28% CALORIE DEFICIT IF CHILD IS NOT BREAST-FED IN 2nd YEAR OF LIFE – DESPITE INCREASING OTHER FOODS BY 60%

Source: Rutishauser, I. H. E., "Growth of the pre-school child in West Mengo district, Uganda". The East African Literature Bureau, Nairobi, 1975.

* Vaccines are not yet available (see Lifelines: ORT), although immunization can prevent the large number of serious cases of diarrhoea which are precipitated by measles.

** In some cases, informing parents of this 'discovery' will merely mean confirming what they or their parents once knew. For the starchy gruels, rice conjees, and carrot soups which were the traditional response to diarrhoea in many parts of the developing world are highly effective forms of 'first-response' ORT.

beginning of diarrhoeal malnutrition. And it helps to reduce the severity and duration of the illness itself.

But because diarrhoeal infections do reduce the body's capacity to absorb fluids and nutrients, the threat of dehydration is still present. The second stage of ORT is therefore the making up of a special oral rehydration solution which should be given to the child to drink in quantities sufficient to replace the amount of fluid lost during the diarrhoea.

Such an oral rehydration solution can be made up in the home using eight teaspoonsfuls of sugar to one of salt in a litre of water (or by making up effective traditional remedies such as carrot soups or rice conjees). Alternatively, parents can use the pre-packed sachets of oral rehydration salts which are now becoming available in most countries. Either way, the secret of the formula is that the glucose allows the body to absorb up to 25 times more fluid and salts than is normally the case in a child suffering from a diarrhoeal infection.[35]

In a relatively small percentage of cases, the diarrhoea will persist and the child will become very obviously ill. In such circumstances, if at all possible, the parent should seek the advice of a health worker and the pre-packed oral rehydration salts, made up to the exact WHO/UNICEF formula, should preferably be used.*[36]

If this simple procedure is followed, then literally millions of children who are now dying each year would recover as a direct result of the treatment given by their own parents in their own homes.

Just as important, this same procedure can significantly reduce the nutritional losses caused by diarrhoeal illness and so help to maintain the normal growth of the child. Recent research in Turkey, India, Iran, the Gambia, and the Philippines has shown that the median difference in weight gain between children who were treated with ORT and those who were not was almost 70 grammes per month (Fig. 18).

ORT is therefore one of the cheapest and most effective ways in which parents themselves can reduce the impact of illness on a child's growth. And by helping to maintain nutritional well-being, the new therapy also helps to maintain resistance against other infections. In other words it can be a force for converting the downward spiral into an upward spiral. And the same can be said for the next basic method by which parents can help to defend their children's growth against the threat of illness.

Vaccine-preventable illnesses

The massive increase in immunization coverage discussed earlier in this report can, of course, prevent several of the most serious childhood illnesses. But in this context of growth, it assumes even greater importance.

Vaccine-preventable illnesses like measles or whooping cough, as well as threatening a child's life, also have a heavy nutritional impact.[37] Therefore immunization against these specific diseases is also a partial 'immunization' against malnutrition. It is likely, for example, that many more children die of malnutrition and illness in the few months following an attack of measles than are killed by the measles itself.[38] And the reason is that measles has led to nutritional losses, growth faltering, lowered resistance, more diarrhoeal or respiratory infections, further weight losses and so on until this whirlpool of infection and nutritional depletion sucks the child down below the level of nutritional health at which life itself can be sustained.

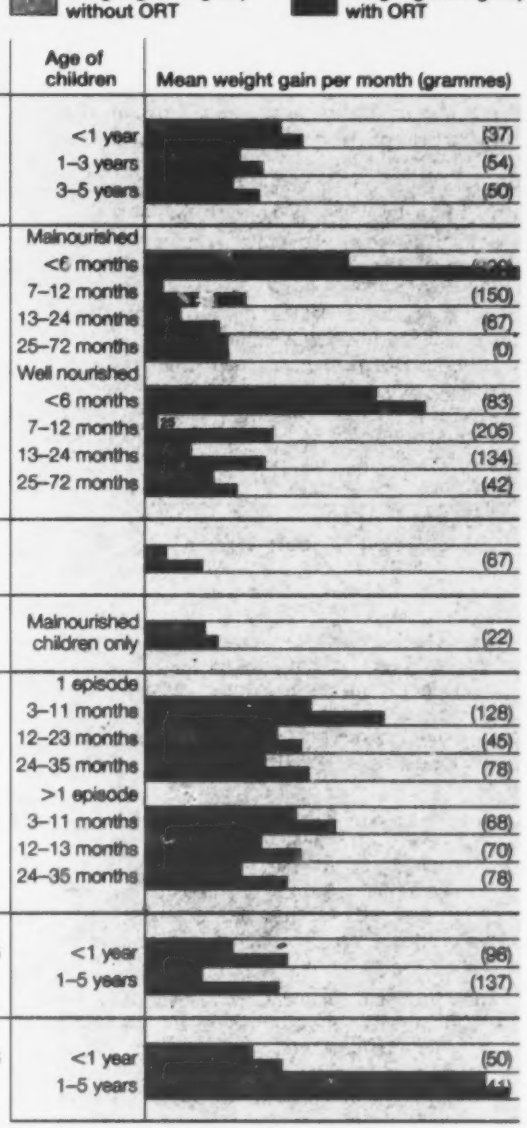
Immunization itself can therefore also help to throw the 'downward synergism' of poor nutrition and frequent ill health into an 'upward synergism' of normal growth and fewer infections.

Respiratory infections

ORT and immunization can shield a child from more than half of the illnesses which strike at life and growth in the earliest years. But that still leaves unchecked the majority of the respiratory infections – infections like influenza, sinusitis,

* In an even smaller percentage of cases, intravenous rehydration therapy may still be necessary.

Fig. 18 Effect of ORT on weight gain in children with diarrhoea



Note: Figures in parentheses indicate the difference in monthly weight gain between the two groups

*Data recalculated in grammes from percentiles

Source: Norbert Hirschhorn, "Oral rehydration therapy: the program and the promise", paper prepared for UNICEF, May 1985.

tonsillitis, laryngitis, pneumonia, otitis media – which underlie the deaths of more than 2 million children a year and undermine the growth of many millions more.[39]

Because young lungs are not fully developed, all children are more vulnerable to respiratory disease. And a child who is weakened by frequent illness and poor nutritional health is more vulnerable still. A child who contracts bronchitis or pneumonia in the developing world is therefore more than 50 times more likely to die from it than is a child in Europe or North America.[40]

For those who survive, growth is often set back. In a severe case of bronchitis or pneumonia, for example, a child may lose as much as 12% of the protein from his or her body.[41] Weakened in this way, the child is then more susceptible to further infection and further malnutrition. To keep the child away from the edge of that steepening slope, basic protection against the main respiratory infections is therefore also necessary. And here too, there are actions which parents and families themselves can take.

First of all, breast-feeding offers a considerable degree of immunity against respiratory infections in the first year of life.[42] Secondly, immunization offers protection against four of the worst offenders – tuberculosis, diphtheria, whooping cough, and the respiratory complications which often wait on measles.

But if respiratory disease does strike, then there are also two vital pieces of knowledge by which a family can protect a child from the worst effects:-

○ As with diarrhoeal infections, parents need to know that continued feeding – and especially breast-feeding – is a vital part of the management of respiratory infections. The child needs both extra foods and extra fluids. And if its appetite is gone, then frequent and persistent attempts to feed will be necessary for the duration of the illness.[43]

○ Secondly, families need to know the early symptoms of an acute lower respiratory infection so that they can, if at all possible, get the child to a health worker or a clinic before life itself is threatened. The most revealing of these symptoms, in almost all cases, is the suddenly rapid rate

Thailand: PHC in practice

With the help of nearly half a million village volunteers, Thailand has brought health services to 95% of its 56,000 villages and their population of about 40 million. The figure was due to reach 100% by the end of 1985 – making Thailand one of the few countries to introduce primary health care (PHC) on a national scale.

Thailand's primary health care policy, adopted in 1977, calls on villagers themselves to join in improving their health and living standards. Teams of villagers, trained for five days as village health communicators (VHCs), pass on knowledge about health, nutrition and hygiene to their neighbours in 10-15 households. One of every ten VHCs is then chosen by the others for a further 15 days' training as a village health volunteer (VHV). Backed by a comprehensive network of health centres and hospitals, VHVs weigh children to monitor their growth, supply first aid and basic drug treatment, provide family planning services and distribute supplementary foods for children and women in need. In mid-1985, 419,300 VHCs were at work alongside 43,000 VHVs.

Thailand's national immunization programme, also launched in 1977, depends on the volunteers to explain to parents the value of immunization and to organize immunization drives. The proportion of children who drop out from three-dose vaccinations has been reduced: the number of children under two fully vaccinated against diphtheria, whooping cough and tetanus has more than doubled, from 21% in 1982 to 53% in 1984, and vaccination against polio, started in 1982, has also reached 53%. Measles vaccination was added to the programme in 1984. In 1977 only 4% of pregnant women received two tetanus shots to protect their unborn child; in 1984 the figure was 40%.

A national oral rehydration programme went into action in 1980, and the government now manufactures 3 million packets of oral rehydration salts a year. VHVs and VHCs alike play a key role in promoting the new therapy to combat diarrhoeal dehydration. Leaflets, posters, and radio and television spots complement their work. A 1983 review found that the programme had already surpassed its interim target: oral rehydration is available to well over 50% of all village children under five.

The VHVs are currently weighing more than 60% of Thailand's pre-school children to monitor their growth and advise mothers on nutrition. Of a million children weighed between 1972 and 1982, only 49% could be considered well nourished; but between October and December 1984, of 1.5 million children weighed, 70% were well nourished. Mild malnutrition had fallen to a third and serious malnutrition to an eighth of the earlier levels. Growth monitoring has also been introduced in Thailand's 31,000 primary schools and every schoolchild now has a growth chart, to complement the lessons in health care which are being introduced into the curriculum.

In over 20,000 villages VHVs operate village drug banks to ensure that essential drugs are available to villagers at a fair price. If 70% of village households buy shares (costing less than a dollar) in a drug bank, the government donates a supply of drugs to start a revolving fund. Drugs are then bought from the government at a discount and sold to villagers at a small profit. The proceeds go to renewing supplies, paying the shareholders and subsidizing medicines for the poorest villagers.

Nutrition co-operatives, active in 6,325 villages, work on the same principle. Villagers use the initial share money and a matching donation by the government and UNICEF to prepare low-cost, high-protein foods for their own use or for sale; VHVs distribute the food packets free to severely malnourished children.

Thailand's voluntary health workers have laid a base for a better future for Thai children. The country is entering 1986 – Mother and Child Health Year in Thailand – with a new emphasis on improving pre-natal care and lowering still further the nation's infant mortality rate, already one of the lowest in Asia.

of the child's breathing, along with fever, obvious breathing distress, a flaring of the child's nostrils, and a drawing in of the spaces between the ribs.[44]

In the home of the community health worker, or at a clinic, the majority of acute respiratory infections can be effectively treated by injections of penicillin or by tablets of antibiotics. And so common and so dangerous are the respiratory illnesses, that there is now the strongest possible case for making antibiotics available not only via doctors but also via much larger numbers of community health workers (see Lifelines: Acute respiratory infections).[45]

The cost is negligible – less than 10 cents per dose. But the effect can be dramatic – almost a 50% reduction in the pneumonia death rate in one major trial so far.[46]

The lives and the growth of children can therefore be sheltered, if not completely protected, against respiratory infections by empowering parents with basic knowledge on both prevention and treatment and by empowering community health workers to use antibiotics (see Lifelines: Acute respiratory infections).

Finally, malarial illness must be included among the most important threats to the life and growth of children in several regions of the developing world.[47] In Africa alone, malaria is now estimated to be responsible for the deaths of almost a million children a year. By the end of the decade, it is quite possible that a low-cost anti-malarial vaccine will have taken its place alongside the other vaccines in national immunization programmes. But in the meantime, a degree of basic protection is possible at relatively low cost. Community health workers, or village volunteers, can distribute chloroquine to all mothers-to-be in order to prevent malaria in pregnancy (which is closely associated with both low birth-weight and maternal mortality) and to all young children who show signs of hay-fever – the major symptom of malaria. (Routine chloroquine prophylaxis is no longer recommended for young children as it can interfere with the development of the child's own immunity.*[48])

* Routine use of anti-malarial drugs is still necessary for travellers to endemic areas and their families.[50]

Feeding in illness

Just as important as the parents' response to any of these specific illnesses is the knowledge that all illnesses threaten the child's nutritional health and normal growth. And the practical significance of that knowledge, to parents, is that there are two basic things which a family can do to minimize the nutritional impact of illness.

The first has already been mentioned – the importance of persisting with food and fluids, frequently and in small amounts, even when the sick child's appetite is low.

The second is special attention to feeding in the few days *after* an illness. It is now known that, in the brief few days following a bout of diarrhoea or a respiratory illness, a child can gain weight at three, four or even five times its normal rate – if particular attention is paid to feeding. Nature itself has therefore provided an opportunity for catching up on the nutritional losses suffered in times of illness – if parents know that the opportunity exists:-

"*No therapeutic goal is as important as the rapid recovery of pre-illness weight after acute infection. Food supplements during this three to five days in convalescence may be one of the most effective means of reducing the nutritional effect of infections and assuring the continued nutritional health of the child. This requires feeding with readily digested foods, administered throughout the day almost as if on prescription. But the opportunity is a brief and fleeting one which remains to be widely exploited*".[49]

Growth checking

In all of these ways, parents and families can provide basic protection for the lives and normal growth of their children – not just against malnutrition or specific individual illnesses, but against the synergistic combination of the two.

And it is against this background of possible protection strategies that the importance of regular growth checking is thrown into clear relief.

Regular monthly weighing, and the recording of the results, makes visible the subtle, vital process of the child's growth – drawing a line

Iodine: protecting the mind

22

The low-cost strategies discussed in this report are of almost universal relevance. But similarly effective and inexpensive solutions also exist for other problems which affect children in specific parts of the world. A quarter of the world's children, for example, are at risk from iodine deficiency, the world's leading cause of preventable mental retardation. Yet iodizing salt – the simplest remedy – costs only 2 or 3 extra cents per kilo. And where iodizing salt is not feasible, iodized oil injections cost as little as 40 cents and give protection for up to five years.

Wherever iodine leaches from the soil, in mountainous regions and flood-prone areas, whole populations are low in iodine. Severe deficiency carries the risk of increased neonatal mortality and visible handicaps for the survivors: stunted growth, poor physical co-ordination, goitre (swelling of the thyroid gland at the base of the throat), deafness, muteness, and cretinism. But the damage done by lesser degrees of iodine deficiency is increasingly being recognized. Even mild iodine deficiency undermines children's physical and mental growth, sapping their energy and slowing the progress of both individuals and communities.

Iodine deficiency is prevalent in the Andes; in much of Africa, especially south of the Sahara; in a wide arc extending from the Middle East through the Himalayas to south-east Asia and into Indonesia, China and Papua New Guinea; and in pockets of Western Europe. In Bolivia 65% of schoolchildren have goitres and in some villages 20% of villagers may be cretins, the result of their mother's iodine deficiency during pregnancy. In highland villages of Ecuador, 60% had goitres before an iodization programme. All of Bhutan's inhabitants are at risk, and in some villages 30% are cretins. In large areas of India, Zaire and the Central African Republic, 5% of infants are born mentally retarded.

Iodization programmes in such countries as Argentina, Colombia, China, Brazil, Ecuador and Zaire have helped to increase birth-weights, lower infant mortality, and improve schoolchildren's intelligence scores. In central Java, cretinism disappeared after a programme combining iodized salt and oil injections; 7% of children born before the programme were cretins. Papua New Guinea achieved similar results with mass injections of iodized oil, followed by legislation for the iodizing of salt.

Though bread, water supplies and even sugar have been iodized, salt is cheaper and technically simpler to treat. Even so, the costs may be high for a poor country, and the collaboration of salt producers difficult to obtain. Organizing the injection teams and transport for iodized injection programmes can prove equally complex.

But as the full impact of iodine deficiency disorders has become clear, more and more countries are returning to the attack. Several Andean governments have launched salt iodizing programmes. Nepal is nearing the end of a five-year drive to inject 2 million of its population of 16 million. Bhutan, which imports its salt from India, has installed an iodizing plant at a border crossing, where all the country's salt is now treated. In India, where 50 million have goitres and 200 million are at risk from iodine deficiency, several hundred new iodizing plants are planned, since only a third of the country's salt is currently iodized; in the meantime iodized oil injections are due to be given to 15 million people in the north, especially young women.

An International Council for the Control of Iodine Deficiency Disorders was established this year (1985), with UNICEF support, to assist governments in tackling the problem. Given political will, community awareness, and backing from salt producers, children could be freed from the burden of iodine deficiency within ten years.

which is the child's 'lifeline', the single most important indicator of its well-being.

The basic aim of regular growth checking is therefore to give parents early warning if a child's growth is beginning to falter. At that early stage, most children can be put back on course by the range of parent-based actions just discussed. Both the technique of detecting the problem – and the practical steps which can be taken to remedy it – are cheap and simple enough to be put at the disposal of the vast majority of parents. That is why the growth checking technique is potentially the greatest breakthrough of all against the malnutrition and infection complex which holds back the normal development of so many of the developing world's children.

At the monthly growth check, health workers can discuss with the parents any and all of the low-cost actions now available – whether it be the timing and spacing of births, the need for extra food and rest in pregnancy, the importance of a full course of vaccination, the method of coping with diarrhoeal illnesses, the importance of continuing to breast-feed, knowledge of when and how to wean a child properly, the reasons for frequent handwashing with soap, or the value of paying particular attention to persistent feeding during and immediately after a child's illness.

And because it is a regular activity, bringing mothers and children into monthly and predictable contact with community health workers, growth checking provides the ideal opportunity for beginning to build community-based primary health care. It can provide, for example, a practical focus for the demonstration of how and when to make and use an oral rehydration solution. It can provide a forum for the visit of an immunization team or for the distribution of vitamin A supplements. It can be the activity through which to supply parents with chloroquine tablets or anti-parasitic drugs. It can be the opportunity for parents themselves to discuss their own concerns and priorities.

Not least, regular growth checking provides a filter for finding those children who are at special risk and who need special help. Even if parents do all that is now possible to protect a child's growth, there will still be a minority of children who will fail to put on weight over a two- or three-month period. Special help is then needed – as it is then clear that the child is simply not getting enough of the right kind of food to eat or that there is a specific health problem such as a heavy parasitic load, or chronic otitis media, or silent tuberculosis. In this way, the regular growth checking of all children also allows other resources, whether it be food supplements or more specialized health care, to be used more efficiently by being targeted to those most in need.

But in the majority of cases, the value of growth checking lies not in the screening of children for treatment but in the education of parents for prevention. That is why there is very little to be gained from the growth checking technique if it merely means that a mother queues up for an hour to have her baby weighed by a health worker who then draws meaningless marks on a meaningless card before calling for the next mother in the line.

To fulfil its potential for drastically improving the nutritional health of children, growth checking needs to be organized on a monthly basis for small groups of women, preferably at a neighbourhood gathering. And if the idea is well understood and the weighing itself is well organized, then growth checking is something which should be looked forward to as a time for mothers to discuss how their children are doing, to meet and exchange experiences with friends, to spend a relaxed and informative few minutes talking with the health worker, to have the chance to ask questions and raise worries, to pick up important practical tips, to reassure themselves and be complimented on the fact that their child is growing well, or to get an early warning and some realistic advice if things are not.

In such a setting, the idea and importance of growth checking can be understood by mothers who may never have been to school. At its simplest, understanding the growth checking idea means understanding that a normal healthy child should be gaining weight every month. On the chart, it means understanding that a rising line means a child is growing well, a level line means that there are things to be done to get the line moving upwards next month, and a falling line shows that there is a definite problem which has to

be acted on straight away and which a mother needs help with. And in explaining this, it is not the mother's literacy or numeracy that matters, but the time taken, the sensitivity shown, and the realism of the advice given.

For all the difficulties – and there are many – the concept of growth checking could therefore stand at the centre of the web of support which it is now possible for parents to spread under their children's health and normal growth.

At the moment, different kinds of growth charts are being introduced in different countries. Several nations, including Brazil, China, Ethiopia, Haiti, and Indonesia have all recently drawn up national growth charts and are in the process of issuing them to parents of all young children. In most cases, the growth chart also carries information about immunization and ORT, about breastfeeding and child spacing, and about other low-cost actions which the parents of a particular nation or region can take to protect their own children in their own circumstances.

But more important than the mechanics of the growth chart itself is the principle of parental involvement in the continuing promotion of the child's health and growth. And in that sense the child's growth chart – in the hands of the mother – is a symbol of a change in the concept of health care which could bring more benefits to the developing world's children than any technological advance.

First, the growth chart is a practical symbol of health care as the continuing protection and promotion of health rather than as the periodic response to illness.

Second, the growth chart is a practical symbol of the change from the idea of health care as passive recipience of services to a concept of health care which sees parents as active participants in the promotion of their own and their family's health.

Children and world development

Growth checking can therefore draw together and unify the range of low-cost parent-based actions now available for protecting the life and the normal development of a child growing up in a poor community. In combination, those actions now have the potential to save the lives of at least half of the 40,000 young children who are now dying each day in the developing world. Just as important, they could help to protect the growth of many millions of the developing world's infants and children.

That is why the present opportunity for the protection of children is also central to the process of development.

Clearly, high death rates, prevalent malnutrition, and frequent illness are closely linked to poverty (Fig. 13). And in that sense, using a packet of oral rehydration salts to prevent a child from dying of diarrhoeal dehydration could be said to be merely attacking symptoms. Except for the fact that the symptom also happens to be a child's life. And except for the fact that there is an obvious and profound connection between the mental and physical development of children and the social and economic development of nations.

Any action – like the use of oral rehydration salts or immunization or improved weaning – which protects not only the child's life but its normal growth, is therefore simultaneously attacking both a symptom of poverty and a cause.

The aim – and the potential – of the revolution in child well-being which is now possible, is therefore not only the saving of lives but the protecting of growth. And on that basis, there is

also a powerful economic case to be made for an all-out effort to put what is now known at the disposal of all parents.

To cite one specific example:-

"*The long-term effects of malnutrition in infancy and childhood are only recently being established. Thus in a 17-year follow-up study of Indian children under five, those who had suffered second or third-degree malnutrition were found to have a 30% deficit in work capacity, as young adults, when compared with the work performance of control subjects from the same social class and villages.*"[1]

Similarly, it is also known that mental development can also be held back by poor nutritional health.

By the age of three or four years, 90% of a person's brain cells are already linked and physical development is advanced to the point where the pattern is set for the rest of a person's life. Those early years therefore cry out for protection – both to defend the child's right to life and its right to develop to its full mental and physical potential – and to invest in the development of people so that they can more fully contribute to, and benefit from, the well-being of their families and nations.

In many parts of the world, it is clear that economic development will not lift the majority out of poverty within the next few years. With this in mind, a recent report prepared for the WHO/UNICEF Joint Nutrition Support Programme has concluded:-

"*... perhaps the most important goal to strive towards is to protect the health and development of the next generation of young children in the world's poorest regions. It is these children who must eventually lead their countries out of economic stagnation and into an era of rapid development.*"[2]

Human capital

In this sense, the protection afforded to the mental and the physical development of children is an investment in human capital. And in the last two decades, there has been a growing realization that human capital formation has perhaps been the neglected factor in the struggle for economic development. As Nobel Prize-winning economist Theo Schultz has commented: "*Increases in the acquired abilities of people throughout the world, and advances in useful knowledge, hold the key to future economic productivity and to contributions to human well-being*".[3]

Similarly, the World Bank, in its annual report on the progress of world development, has concluded: "*Few would dispute that the health, education and well-being of the majority of the people in industrialized countries are a cause, as well as a result, of national prosperity. Similarly, people who are unskilled and sick make little contribution to a country's economic growth*".[4]

From here it is but a short step to the conclusion that spending on such services as health and education – and especially on the protection of children's normal growth – should not automatically be listed on the 'consumption' side of the national economic equation. For they are the most basic of investments in human capital. And if it can be shown, as the World Bank has shown in several specific instances, that health care increases work capacity or that primary education increases the productivity of farmers, then why should spending on health or education be classified as 'consumption' rather than 'investment'?[5]

Equally clearly, a renewed stress on the importance of human capital leads naturally to a concern for the special problems of the young child. As Hans Singer, Professor of Development Economics at Britain's Institute for Development Studies, said at a UNICEF symposium held earlier this year: "*Any long-term policy of human investment or human capital formation must start with today's children... malnutrition amongst children has more devastating and more irreversible and more long-term effects on the future productivity of children than is the case with adults.*"[6]

But in the real world of recent years, the logic of investing in children has made little progress against the head wind of economic recession. UNICEF's 1984 study of *The impact of world recession on children* documents the cut-backs in government spending on such services as health and education in the early 1980s. And this year's

special report on Africa (see box in Preface) describes how the adjustment to recession has meant that the main burden has again been passed on to those who are least able to sustain it – the poorest families and their children.

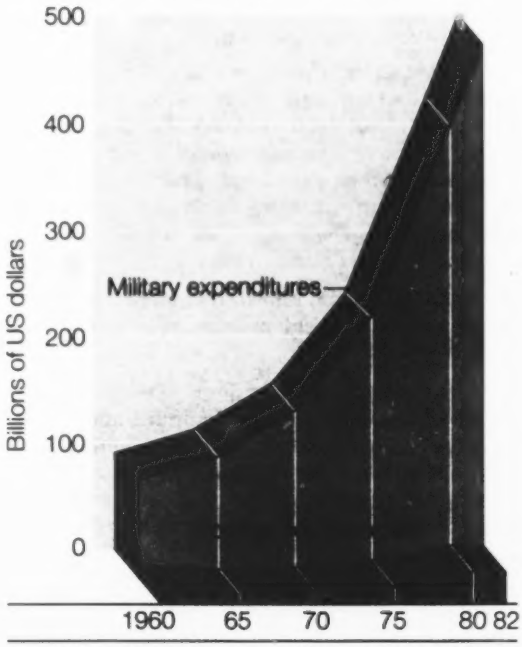
Summing up this declining investment in today's children – and tomorrow's world – World Bank figures show that the 43 countries with the highest infant mortality rates (over 100 deaths per 1,000 live births) are currently spending three times as much on defence as on health. Meanwhile, aid from the industrialized nations (OECD countries) has fallen from 0.51% of their combined GNP in 1960 to 0.37 in 1982. And of that less than one-half of 1% of GNP, less than one-tenth is allocated to health.

Meanwhile, arms spending has continued to increase in both industrialized and developing nations (Fig. 19) to the point where the industrialized world is now spending more than 20 times as much on the military as on development assistance and the developing world itself is spending twice as much on arms as on the health of its children.

In total, world-wide spending on armaments now exceeds the combined incomes of the poorest half of humanity. It is a statistic which casts a shadow of shame on our generation. For as Dwight Eisenhower said almost a generation ago:-

"This world in arms is not spending money alone. It is spending the sweat of its laborers, the genius of its scientists, the hopes of its children... This is not a way of life at all in any true sense. Under the cloud of threatening war, it is humanity hanging from a cross of iron."

Fig. 19 Military and aid expenditures, industrialized nations, 1960–1982



Source: World Development Report 1984, The World Bank, Washington DC, 1984.

The halt of progress

Through economic recession and falling prices for the labours and raw materials of the developing world, through rising debts and interest rates, through falling levels of aid and concessional loans, through increased arms spending and the distortion of development to the benefit of the few, investments in 'human capital', and particularly in the protection of children, are therefore now declining in many of the poorest nations of the world.

Progress against absolute poverty is therefore coming to a halt. And the achievements of recent decades are coming under threat in our times.

With the issuing of this report, UNICEF itself begins its fortieth year. And in general, those four decades have been a period of unprecedented progress. In the developing world as a whole:-

- Infant and child death rates have been almost halved.
- Average life expectancy has increased by approximately 40%.
- The proportion of children who enter school has been lifted from less than 30% to more than 80%.
- Food production has been trebled while population has doubled – and the rate of population growth has been slowed down in every region

of the world except Africa south of the Sahara (Fig. 20).

○ Average real incomes have been almost doubled.

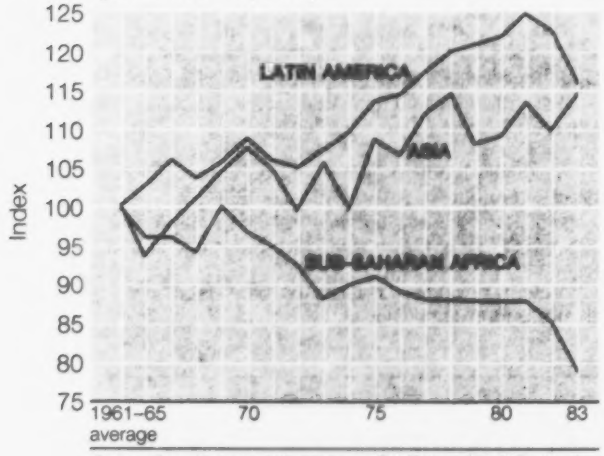
By any historical standards, these are remarkable achievements. But it is equally clear that over large parts of the earth's surface, this progress has been shuddering to a halt in the late 1970s and early 1980s:-

In Latin America, where average real incomes have fallen by as much as 25% in many nations, there is fragmentary but alarming evidence of a rise in the incidence of malnutrition and illness, in the number of low birth-weight babies being born (Fig. 21), in the rate of infant and child deaths, and in the numbers of children who are being abandoned on the streets of the cities.

Only in Asia, where several of the most populous nations have been able to insulate themselves from the worst effects of the industrialized world's recession, has progress in child health and nutrition been maintained and even accelerated. In particular, countries like China, India, Pakistan, Indonesia, and Thailand, countries which together are home to nearly half the world, have achieved or are moving towards new levels of protection for the lives and growth of the next generation (see panel 21).

Fig. 20 Food production per person, Africa, Asia, and Latin America, 1961–1983

Index of per capita food production, based on the average figure for 1961–65 (= 100).



Source: "Towards sustained development in Sub-Saharan Africa", The World Bank, Washington DC, 1984 (based on data provided by the United States Department of Agriculture).

But in sub-Saharan Africa, as all the world now knows, development has not only come to a halt but begun to slide, carrying millions of families back towards the edge of subsistence and beyond.

This year, a special UNICEF report on Africa's complex problems has already been issued. The human consequences of those problems have been seen on virtually every television screen and in virtually every newspaper in the world. But they have never been more movingly expressed than in the unaccompanied words of one of Africa's foremost novelists, Chinua Achebe:-

"No madonna and child could touch that picture of a mother's tenderness for a son she would soon have to forget...

"She held a ghost smile between her teeth, and in her eye the ghost of a mother's pride as she combed the rust-coloured hair left on his skull and then – singing in her eyes – began carefully to part it.

"In another life this must have been a little daily act of no consequence before his breakfast and school; now she did it like putting flowers on a tiny grave."

A safety net of protection

Even in nations where there has been no visible famine, the adjustment to economic crisis has meant a cutting back of the kind of services which are essential for the protection of both life and long-term development. Thousands of school-teachers have been dismissed and tens of thousands of children are not being educated as a result. Food subsidies for pregnant mothers and children are being cut back and malnutrition is measurably on the increase (Fig. 22). Clinics are being closed and immunization programmes are being brought to a halt for the lack of fuel and spare parts for vehicles. Spending on essential social services has fallen even in countries with the most praiseworthy track records of commitment to the protection of the poor.

The Code: a progress report

23

In a poor community of the developing world, bottle-fed babies have been found to be two or three times more likely to die in infancy than babies who are exclusively breast-fed for the first few months.

But bottle-feeding is on the rise in many towns and cities of the developing world. And the inevitable result has been poor nutritional health, and often death, for many thousands of infants.

In May 1981, after a ten-year campaign by health professionals, non-governmental organizations, and international agencies, the World Health Assembly adopted the International Code of Marketing of Breast-milk Substitutes. The Code asks all governments, in developed and developing countries alike, to protect and encourage breast-feeding. More specifically, it calls on commercial baby-food companies to end the promoting of infant formula directly to the public or through health centres.

Most infant-formula manufacturers have accepted the Code's main provisions, in principle. Yet the Code can only become fully effective if it is backed up by national governments. In the four and a half years since the Code was adopted, the following countries have taken action:-

○ **Code in effect as actual law**
Argentina, Kenya, Peru, Sri Lanka

○ **Some of the Code in effect as law**
Belgium, Botswana, Brazil, Colombia, Denmark, Egypt, Ethiopia, Finland, France, Guinea, Haiti, Indonesia, Israel, Italy, Mozambique, Nicaragua, Papua New Guinea, Tunisia, Venezuela, Zaire, Zambia, Zimbabwe

○ **Government controls distribution**
Algeria, Bulgaria, China, Cuba, Czechoslovakia, Democratic Yemen, Hungary, Libya, Mongolia, Mozambique, Romania, Soviet Union, Togo, Viet Nam

○ **Code recommended by government committee and awaiting legislation**
Bolivia, Cameroon, Central African Republic, Congo, Costa Rica, Ecuador, Ethiopia, Fiji, Guatemala, India, Israel, Jordan, Lesotho, Libya, Mexico, Mozambique, Nepal, Pakistan, Rwanda, Samoa, Sierra Leone, Swaziland, Tunisia, Uganda, Zambia, Zimbabwe

○ **Code in effect as a voluntary measure**
New Zealand, Portugal, Sweden, Syria, Trinidad and Tobago, Yugoslavia

○ **Some of the Code's provisions in effect as a voluntary measure**
Australia, Canada, Chile, Cook Islands, El Salvador, Finland, France, Gabon, German Democratic Republic, Hong Kong, Ivory Coast, Japan, Netherlands, Norway, Panama, Philippines, Thailand

○ **Code being studied by working party**
Afghanistan, Bahrain, Bangladesh, Burkina Faso (Upper Volta), Denmark, Dominica, Grenada, Honduras, Iran, Italy, Kuwait, Malawi, Mali, Morocco, Panama, Paraguay, Saudi Arabia, Senegal, Saint Vincent, Tanzania, Turks and Caicos Islands

○ **National code of marketing under discussion incorporating some of the International Code's provisions**
Austria, Brazil, Denmark, Dominican Republic, Malaysia, Sudan, Turkey, Yemen

○ **Voluntary code prepared by baby-food industry in effect**
Federal Republic of Germany, Ireland, Malaysia, Nigeria, Singapore, Switzerland, United Kingdom

○ **Voluntary code prepared by baby-food industry under discussion**
European Economic Community, Ivory Coast

Note: some countries may appear under more than one heading since, for example, a voluntary code may be in effect while legislation is pending.

As UNICEF has argued in its special report on Africa, adjustment to economic crisis need not and should not involve increasing the poverty and deprivation of a nation's poorest families. Specifically, it should not be allowed to threaten the lives and the normal growth of the most vulnerable section of any community – the children of the poor. Passing on the burdens of recession to those who have the least political muscle to resist the blow, and the least economic fat to absorb it, is not only unjust and inhuman – it also undermines the health and growth of the poorest children and so copes with the crisis of today only by guaranteeing more crises tomorrow.

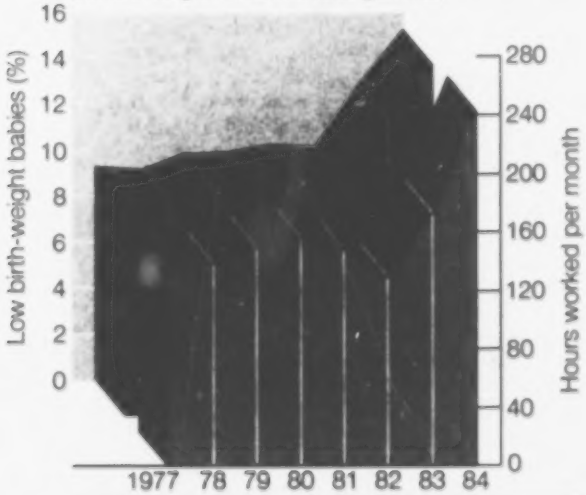
A better way has to be found. And since Africa's crisis is as much of the world's making as of Africa's own, both justice and humanity now demand that the international community should share in the challenge of protecting the progress that has been made and of constructing a safety net of basic protection below which the poorest families and children will not be allowed to fall. As the United Nations Committee for Development Planning has argued:-

"Many African governments have begun to implement major structural reforms. Others would be ready to begin if they were assured of the necessary extra resources and technical support. We urge the governments of the industrialized countries to commit themselves now to their share of the responsibility for assuring at least a minimally tolerable future for Africa over the next decade."

The first strands in that safety net of protection are the strategies for protecting the lives and the growth of the poorest children (see panel 14). Breast-feeding, improved weaning (including supplementary food for those most at risk), immunization, oral rehydration therapy and growth monitoring, are among the most vital of all available techniques for meeting the needs of both immediate survival and the long-term need for the protection of growth. And because all of them can be put into action at relatively low cost, they are therefore practical symbols, in the field of child well-being, of the possibility of coping with economic crises at the same time as investing in, rather than mortgaging, the future.

Fig. 21 Increase in low birth-weight, Recife, Brazil, 1977–1984

127,948 births, poor urban areas of Recife, Northeast Brazil
(low birth-weight = less than 2500 grammes)



Source: L. Dias, M. R. Camarano, A. Lechtig, "Drought, Recession, and Prevalence of Low Birth-weight Babies in Poor Urban Populations of the Northeast of Brazil", report from UNICEF Brasilia, 1985.

The silent emergency

UNICEF and many other organizations are now working with governments to put these ideas into action in both the well-publicized emergencies of Africa and in the quieter crises diffused throughout the developing world (Fig. 9).

And to conclude this year's report, it is appropriate to turn to just one example of that quieter crisis, to just one village, and to just one of the many millions of mothers with whom UNICEF has made contact over the last forty years.

That mother's name is Maria Auxilia Paja. Her home is in an ordinary rural area of South America. Not long before the arrival of a trained health worker in her village, two of her children

Parasites: the damage to growth

24

The low-cost child survival measures discussed in this report can also have a significant impact on the problem of intestinal worms and parasites that sap children's growth wherever poverty, overcrowding and lack of hygiene co-exist. Breast-feeding, for example, protects young children against the dangers of contaminated water in feeding-bottles. Human breast-milk also contains a factor which kills the organisms of giardiasis and amoebiasis, two major causes of diarrhoea in children; and oral rehydration therapy can stave off the worst effects of diarrhoea. When parasitic infections cannot be prevented, they can be reduced at little cost: a drug treatment for worms can cost less than 5 US cents.

Large parasite loads eat at their host's supply of nutrients, doing their greatest damage to the growing bodies of young children:-

○ The intestinal roundworm *Ascaris* infects 1,000 million people, or a quarter of the world's population. Twenty roundworms – by no means an unusual load – consume 2.8 grammes of carbohydrate a day and can eat up nearly 10% of a child's total energy intake.

○ Hookworm infects some 900 million people and often causes severe anaemia. Among pregnant women, anaemia increases the risk of low birth-weight and its attendant high mortality.

○ Giardiasis and amoebiasis, infecting 600 million between them, cause diarrhoea and poor absorption of nutrients.

○ The debilitating blood fluke of schistosomiasis, carried by a freshwater snail, is endemic in 74 countries. Ironically, irrigation projects have encouraged its spread. Some 200 million people are infected and a further 400 million at risk.

Children are both the principal victims and the main agents of transmission, excreting parasite eggs and cysts into the soil and water where they play and where they can repeatedly pick up the infection. As well as draining children's nutritional reserves, multiple worm burdens can cause oral polio vaccine to lose its effectiveness.

In the long run, parasite control entails breaking the cycle of infection and reinfection. In the industrialized world and some developing countries, improved standards of living – and especially of water supply and sanitation – have steeply reduced infection rates. In Costa Rica, for example, the last twenty years have seen a steady increase in clean water supply, latrines, and the wearing of shoes (which prevent hookworm from entering through the skin); parasite infections have fallen to a tenth of their earlier level.

But for many countries clean water and sewerage systems carry a high price tag. So most efforts to control parasitic infections centre on mass deworming campaigns, which can also be a starting-point for community health education. Successful deworming campaigns produce immediate and highly visible results, and encourage communities to reduce parasitic infections by knowing more and doing more about hand washing, hygienic food handling, avoiding contaminated water, and sanitary waste disposal.

The Japanese Organization for International Cooperation in Family Planning, active in several Asian and Latin American countries, uses parasite control to spark community interest in improved nutrition and in family planning. In two counties of the Republic of Korea, a project which motivated communities by training their leaders and conducting outdoor campaigns on market-days brought parasite infection rates down from 50.6% in 1977 to 5.3% in mid-1983. At the start of another project in north-east Brazil in 1980, 46.3% of rural schoolchildren and 42.8% of urban schoolchildren had roundworm and hookworm: after three deworming treatments over two years, the children's infection rates were 14.1% in the rural areas and 6.1% in the towns.

had died – one from a respiratory infection and one from measles. Or in Maria Auxilia's exact words:-

"For the baby boy, I tried to get help. But as I was carrying him for help, he just died in my arms.

"My daughter was older. I had got used to playing with her, being with her. It's difficult... it's sad to remember those times with my children. She was alright when she went to bed. By midnight she was sick. She died just as day broke.

"I am not alone. It's happened to a lot of women."

Maria Auxilia Paja is indeed not alone. In the last twelve months, approximately 15 million mothers like her have been forced to watch their children die.

The vast majority of those 40,000 children never looked into a television camera and were never seen by anyone outside their own community. They did not die in any particular place or at any one particular time or from any one particular cause. They were therefore not news. But they nonetheless suffered, and they are nonetheless dead.

Theirs was the 'silent emergency'.

In the last year, the 'loud emergency' of Africa has been met with private generosity and public concern on an unprecedented scale. In almost all nations of the world, many millions of men, women and children have made it clear that they do not find such suffering acceptable in a world which so clearly has the financial and technical resources to prevent it.

That response is, in itself, an important milestone on the road to a more genuinely civilized world community. Forty years ago, when UNICEF was founded, there was no such international response to the great 1943-1944 famine in Bengal, in which even greater numbers of men, women and children lost their lives.

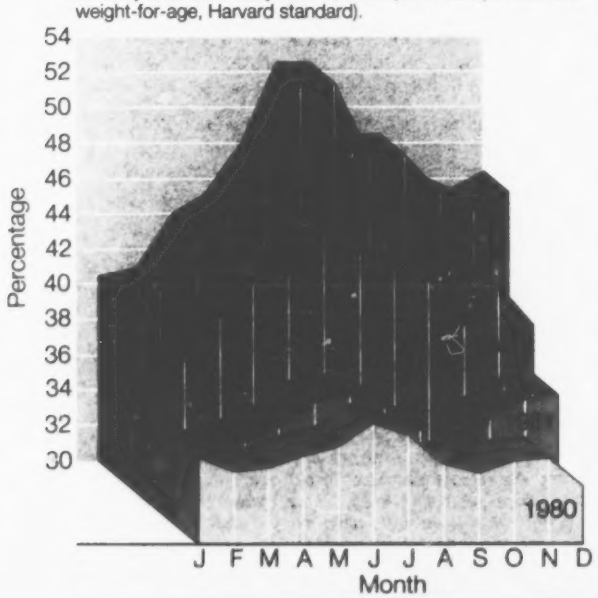
The international response to Africa's desperate need therefore marks the development, in our lifetime, of a different degree of global consciousness and concern. But if it is to match the scale and urgency of the problem itself then, in the remaining years of this century, that concern will have to be translated into new dimensions.

First, the concern for poverty and the concern for justice need to be translated into a concern for the quiet emergencies as well as for the loud. For just as the *seen* suffering of Africa has been regarded as unacceptable by so many citizens in 1985, so the unseen and unnecessary sufferings of much larger numbers of children in poor communities throughout the world must also become unacceptable, to both people and governments, if we are to continue making progress towards a more genuinely civilized – and peaceful – world.

Second, it needs the dimension of political and economic action by governments. The world-wide private generosity of millions of individuals in response to the African emergency has amounted to perhaps $300 million. The amount pledged by governments in extra aid for Africa in 1985 has amounted to approximately $3,000 million. And

Fig. 22 Increase in child malnutrition, Ghana, 1980–1983

Percentage of pre-school children (aged 7 to 44 months) severely and moderately malnourished (below 3rd percentile of weight-for-age, Harvard standard).



Source: Catholic Relief Services – Ghana.

Population: less deaths – less births

25

For the last three years, the *State of the World's Children* report has described the breakthroughs which now make it possible to save the lives of several million children each year. But the most commonly asked question about this potential for a revolution in child survival is 'won't it lead to even more rapid population growth?'

Paradoxically, the answer is 'no'. A sharp reduction in child deaths would lead to an eventual reduction in population growth:-

○ Many parents 'insure' against child deaths by having more children. If parents become confident that their existing children will survive, they tend to have only the number of children they actually want. As the late Indira Gandhi said in 1983, "*parents are more likely to restrict their families if they have reasonable assurance of the health of survival of their two children*".*

○ Several of the key low-cost strategies for reducing child deaths are also key strategies for reducing births:-

Family spacing. In poor communities, infant mortality is typically twice as high when the interval between births is less than two years. Birth spacing is therefore a key strategy for child survival and reducing birth rates.

Female literacy is another powerful determinant of child survival. And as the World Fertility Survey has shown, rising female literacy also brings steadily falling birth rates.

Breast-feeding is also a key to child survival. And a mother who is breast-feeding is also protected, to a significant degree, against becoming pregnant.

○ If an infant dies, breast-feeding obviously stops and its effect in inhibiting conception is lost. In this way too, saving a child's life can help to postpone the next birth.

As important as any of these individual links between falling deaths and falling births is the overall fact that the 'child survival revolution' increases parents' sense of control over their lives. Probably the most important prerequisite for the acceptance of family planning is the growing confidence of parents that they can improve their lives by their own informed decisions and actions. Anything which helps to increase that confidence, as all parent-based child survival strategies do, is therefore also likely to lower birth rates.

These arguments are borne out by those countries which have already achieved a revolution in child survival. Nations such as China, Sri Lanka, the Republic of Korea, Costa Rica, and Singapore now have the lowest infant death rates – and the lowest birth rates – in the developing world. Taking their experience as a guide, it has been estimated that a country which has halved its infant mortality over the last two decades can now expect its population to stabilize at a level 30% to 40% smaller than would otherwise have been the case. Put another way, if all of India had the same low infant mortality and the same low birth rates as Kerala state, the nation as a whole would have approximately 4.4 million fewer deaths each year – and 7.5 million fewer births.

A revolution in child survival, far from exacerbating the problem of population growth, could therefore contribute to its early decline. That is why the 1984 World Population Conference in Mexico included in its final declaration this statement:-

"*Through breast-feeding, adequate nutrition, clean water, immunization programmes, oral rehydration therapy, and birth spacing, a virtual revolution in child survival could be achieved. The impact would be dramatic in humanitarian and fertility terms.*"

* The same point has been made by the President of the World Bank: "*Poor parents worry about who will take care of them in their old age or when they are ill, and for many the need for support in old age outweighs the immediate cost of children. Since many children die young ... the incentive to have many babies, to ensure that a few survive, is very great.*"

in the meantime, the amount which Africa has paid back to the industrialized world in debt and interest repayments during 1985 has amounted to over $7,000 million. Those figures do not lessen the importance of the generosity of millions or the results it has achieved. But they brutally demonstrate that economic and political action – by governments in both developing and industrialized nations – is a prerequisite of any solution which matches the scale of the problem.

A choice for the 1980s

Present knowledge holds out the opportunity to provide, for the first time, a basic minimum protection for the lives and growth of all the world's children and to do so at a very low cost and in a very short time.

Several nations are already beginning to take up that opportunity – and with some remarkable early results.

To fulfil that potential, it is clear that – above all else – parents need to be empowered with information and support from all sides. They need the support of their own political leaders and of the international community, of the health services and of all branches of government, of the community health workers and the mass media, of the schoolteachers and the religious leaders, of the community organizations and the women's movements, of the employers and the trade unions, and of people's movements in both developing and industrialized nations.

If this opportunity is taken, then the years ahead could see the achievement of one of the greatest goals which mankind has ever set for itself – basic protection for the lives and the health and the normal development of all its children. If that opportunity is not taken, then the 1980s and 1990s will be rightly stigmatized as the generation which failed to protect and maintain the hard-won progress of the post-war years and which presided over the co-existence of unprecedented financial and technical capacity with the continued malnutrition, stunting, and death of millions of its most vulnerable citizens.

The choice is ours.

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Basic statistics

In the following table, countries are listed in descending order of infant mortality rounded to the nearest 5 in the case of countries with a rate of 50 deaths or more per 1,000 live births. Countries with the same rates are listed alphabetically. The reference numbers indicating that order are shown in the alphabetical list of countries below.

Afghanistan	1	Guyana	86	Pakistan	30
Albania	79	Haiti	23	Panama	94
Algeria	48	Honduras	55	Papua New Guinea	62
Angola	10	Hong Kong*	117	Paraguay	80
Argentina	85	Hungary	102	Peru	43
Australia	115	India	36	Philippines	76
Austria	110	Indonesia	51	Poland	103
Bangladesh	22	Iran (Islamic Rep. of)	32	Portugal	100
Belgium	112	Iraq	60	Romania	93
Benin	28	Ireland	118	Rwanda	25
Bhutan	13	Israel	108	Saudi Arabia	70
Bolivia	26	Italy	111	Senegal	18
Botswana	58	Ivory Coast	37	Sierra Leone	3
Brazil	64	Jamaica	99	Singapore	123
Bulgaria	104	Japan	130	Somalia	9
Burkina Faso	11	Jordan	72	South Africa	52
Burma	65	Kampuchea	6	Spain	119
Burundi	27	Kenya	56	Sri Lanka	82
Cameroon, U. Rep. of	41	Korea, Dem. Rep. of	88	Sudan	31
Canada	121	Korea, Rep. of	89	Sweden	128
Central African Rep.	14	Kuwait	98	Switzerland	127
Chad	15	Lao People's Dem. Rep.	29	Syrian Arab Rep.	71
Chile	97	Lebanon	77	Tanzania, U. Rep. of	35
China	81	Lesotho	38	Thailand	78
Colombia	75	Liberia	24	Togo	44
Congo	54	Libyan Arab Jamahiriya	46	Trinidad and Tobago	96
Costa Rica	101	Madagascar	69	Tunisia	53
Cuba	105	Malawi	4	Turkey	49
Czechoslovakia	106	Malaysia	90	Uganda	39
Denmark	124	Mali	2	USSR	95
Dominican Rep.	59	Mauritania	19	United Arab Emirates	84
Ecuador	66	Mauritius	92	United Kingdom	120
Egypt	42	Mexico	73	USA	114
El Salvador	67	Mongolia	74	Uruguay	91
Ethiopia	7	Morocco	47	Venezuela	83
Finland	129	Mozambique	8	Viet Nam	63
France	122	Nepal	17	Yemen	20
German Dem. Rep.	113	Netherlands	125	Yemen, Dem.	21
Germany, Fed.Rep. of	116	New Zealand	109	Yugoslavia	87
Ghana	45	Nicaragua	61	Zaire	40
Greece	107	Niger	12	Zambia	50
Guatemala	68	Nigeria	33	Zimbabwe	57
Guinea	5	Norway	126		
Guinea-Bissau	16	Oman	34	*Colony	

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BASIC INDICATORS

		Infant mortality rate (under 1)		Total population (millions)	Annual no. of births/infant and child deaths (0–4) (thousands)	GNP per capita (US $)	Life expectancy at birth (years)	% adults literate male/female	% of age group enrolled in primary school male/female	% share of household income 1970–1982	
		1983	1960	1983	1983	1983	1983	1980–1983	1980–1983	lowest 40%	highest 20%
	Very High IMR countries (over 100) Median	**150**	**180**	**1.340**	**31,247/8,787**	**370**	**46**	**38/19**	**74/42**		
1	Afghanistan	195	220	14.2	725/246	170*	37	30*/5*	19/9		
2	Mali	180	210	7.6	378/118	160	42	14*/6*	35*/20*		
3	Sierra Leone	180	225	3.5	164/51	330	34	31/17	46*/32*	15*	53*
4	Malawi	165	210	6.6	339/97	210	45	48/25	72/51	22*	51*
5	Guinea	160	215	5.2	240/65	300	40	35/14	44/21	. .	. .
6	Kampuchea	160	150	6.9	314/75	70*	43	78/39	/	. .	. .
7	Ethiopia	155	180	34.5	1,683/440	120	43	/	58/34	. .	. .
8	Mozambique	155	175	13.3	578/151	230*	49	44/12	91/68	. .	. .
9	Somalia	155	180	5.3	236/62	250	43	11/3	33/18	. .	. .
10	Angola	150	215	8.3	389/98	470*	42	36/19	/	. .	. .
11	Burkina Faso	150	230	6.6	314/80	180	42	15*/3*	31/18	. .	. .
12	Niger	145	195	5.8	292/72	240	43	14/6	34/19	. .	. .
13	Bhutan	140	190	1.4	52/11	80*	46	/	31/16	. .	. .
14	Central African Rep.	140	190	2.4	108/26	280	43	48/19	98/51	. .	. .
15	Chad	140	200	4.8	210/51	80*	43	35/8	51*/19*	. .	. .
16	Guinea-Bissau	140	195	0.9	35/8	180	43	33*/9*	88/40	. .	. .
17	Nepal	140	190	15.7	649/140	160	46	32/9	93/39	13	59
18	Senegal	140	185	6.2	292/70	440	43	31/14	61/41	. .	. .
19	Mauritania	135	195	1.8	88/20	480	44	/	45/29	. .	. .
20	Yemen	135	220	6.2	300/67	550	44	18/2	99/17	. .	. .
21	Yemen, Dem.	135	220	2.0	95/21	520	46	48*/8*	94/34	. .	. .
22	Bangladesh	130	160	95.8	4,240/867	130	48	40/18	74/46	17	47
23	Haiti	130	205	6.3	256/48	300	53	37/33	74/64	6	48*
24	Liberia	130	185	2.1	99/22	480	49	30*/12*	95/57	11	73
25	Rwanda	130	150	5.7	288/64	270	50	51*/27*	65/60	. .	. .
26	Bolivia	125	170	6.0	263/52	510	51	76*/51*	94/81	13	59
27	Burundi	125	160	4.4	207/43	240	44	39/15	41/25	. .	. .
28	Benin	120	195	3.8	191/38	290	43	25*/10*	92/43	. .	. .
29	Lao People's Dem. Rep.	120	160	4.2	169/30	80*	50	51/36	97/82	. .	. .
30	Pakistan	120	170	96.0	4,018/733	390	50	36/15	57/31	20	42
31	Sudan	120	175	20.4	923/182	400	48	38/14	59/42	13*	50*
32	Iran (Islamic Rep. of)	115	175	42.5	1,700/286	2,160*	60	48*/24*	111/81	13*	54*
33	Nigeria	115	195	89.0	4,431/846	770	49	46/23	/	. .	. .
34	Oman	115	220	1.1	52/10	6,250	50	/	89/63	. .	. .
35	Tanzania, U. Rep. of	115	150	21.0	1,043/200	240	51	62*/31*	94/85	16*	50*
36	India	110	175	732.3	24,095/4028	260	53	55/26	100/68	16	49
37	Ivory Coast	110	210	9.2	415/68	710	47	45/24	91*/58*	20	50
38	Lesotho	110	150	1.4	60/9	460	49	58/81	94/126	. .	. .
39	Uganda	110	140	14.6	720/134	220	52	65/41	65/49	17	47
40	Zaire	105	150	31.2	1,390/247	170	50	74/37	103*/74*	. .	. .
	High IMR countries (U. 100) Median	**75**	**150**	**9.021**	**394/67/8,787**	**820**	**48**	**55/25**	**119/99**	**12**	**48**
41	Cameroon, U. Rep. of	100	170	9.2	394/67	820	48	55*/25*	119/99	. .	. .
42	Egypt	100	185	44.5	1,692/251	700	57	54*/22*	101/76	17	48
43	Peru	100	150	18.7	679/97	1,040	59	90/75	120/112	7	61
44	Togo	100	195	2.8	124/21	280	49	46/20	137/90	. .	. .
45	Ghana	95	135	12.6	587/94	310	52	59/37	85/66	. .	. .
46	Libyan Arab Jamahiriya	95	170	3.3	150/21	8,480	58	67*/30*	/	. .	. .
47	Morocco	95	170	22.1	961/136	760	58	41/18	100/62	12	49
48	Algeria	90	175	20.6	916/117	2,320	58	57/32	106/82	. .	. .
49	Turkey	90	205	47.7	1,536/177	1240	63	81/50	105/95	12	57
50	Zambia	90	140	6.2	296/42	580	51	79/58	100/89	11	61
51	Indonesia	85	145	159.4	4,841/655	560	53	78/58	116/109	14	49
52	South Africa	85	140	30.8	1,181/132	2,490	53	/	/	. .	. .
53	Tunisia	85	165	6.9	232/28	1,290	61	61/32	126/100	15	42
54	Congo	80	155	1.7	73/9	1,230	47	70/44	/	. .	. .
55	Honduras	80	150	4.1	177/22	670	60	59*/55*	102/100	7*	68*
56	Kenya	80	130	19.0	1,029/132	340	53	60/35	109/91	9	60
57	Zimbabwe	80	115	8.2	381/49	740	56	77/61	135/126	. .	. .
58	Botswana	75	120	1.0	50/5	920	54	61/61	89/102	8	60
59	Dominican Rep.	75	130	6.0	195/18	1370	63	/	104/115	15	54
60	Iraq	75	150	14.7	648/69	3,020*	59	68/32	113/99	. .	. .
61	Nicaragua	75	150	3.1	134/15	880	60	/	101/107	9*	65*
62	Papua New Guinea	75	175	3.5	140/14	760	53	48/30	68/55	. .	. .
63	Viet Nam	75	165	57.2	1,766/186	170*	59	91*/78*	120/105	. .	. .
64	Brazil	70	120	129.8	3,929/377	1,880	63	76/73	106/99	7	67

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		Infant mortality rate (under 1)		Total population (millions)	Annual no. of births/infant and child deaths (0–4) (thousands)	GNP per capita (US $)	Life expectancy at birth (years)	% adults literate male/female	% of age group enrolled in primary school male/female	% share of household income 1970–1982	
		1983	1960	1983	1983	1983	1983	1980–1983	1980–1983	lowest 40%	highest 20%
65	Burma	70	165	37.6	1,406/136	180	55	76/56	75*/70*	21	40
66	Ecuador	70	130	8.8	353/34	1420	63	84/76	117/114		
67	El Salvador	70	155	5.2	208/20	710	65	73*/67*	68/68	16	47
68	Guatemala	70	130	7.9	301/36	1,120	61	54*/39*	78/67	13	60
69	Madagascar	65	115	9.5	415/43	310	50	68/55	78*/71*	.	.
70	Saudi Arabia	65	180	10.4	440/40	12,230	56	35/12	81/56	.	.
71	Syrian Arab Rep.	60	145	9.8	450/36	1,760	67	72/35	113/92	.	.
72	Jordan	55	145	3.2	144/10	1,640	64	80*/51*	105/100	.	.
73	Mexico	55	100	75.1	2,516/193	2,240	66	86/80	120/117	10	58
74	Mongolia	55	120	1.8	60/4	780*	65	93/86	105/107	.	.
	[illegible]										
75	Colombia	50	100	27.5	845/63	1,430	64	86/84	129/132	10	60
76	Philippines	50	85	52.1	1,663/138	760	65	84/83	115/113	14	54
77	Lebanon	48	75	2.6	78/5	1070*	65	83/64	115/105	.	.
78	Thailand	48	110	49.6	1,399/86	820	63	92/84	98/94	15	50
79	Albania	45	125	2.9	80/4	840*	71	/.	105/99	.	.
80	Paraguay	45	90	3.5	123/8	1,410	65	90/85	107/99	.	.
81	China	39	180	1,039.7	19,096/1041	300	67	79/51	128/103	18	39
82	Sri Lanka	39	75	15.7	422/22	330	67	91/81	104/99	19	43
83	Venezuela	39	90	17.3	598/28	3,840	68	87/83	106/104	10	54
84	United Arab Emirates	38	160	1.2	31/1	22,870	71	58*/38*	93/93	.	.
85	Argentina	36	60	29.6	722/31	2,070	70	94/94	107/107	14	50
86	Guyana	36	75	0.9	26/1	520	68	96/93	99/99	.	.
87	Yugoslavia	32	105	22.9	372/13	2,570	71	96/84	101/100	19	39
88	Korea, Dem. Rep. of	30	100	19.2	578/22	1,130*	65	/.	118*/114*	.	.
89	Korea, Rep. of	30	100	39.8	829/32	2,010	68	96/88	106/106	17	45
90	Malaysia	30	80	14.9	430/17	1,860	67	80/60	100/98	11	56
91	Uruguay	30	55	3.0	58/2	2,490	70	93*/94*	110/107	16*	46*
92	Mauritius	28	80	1.0	26/1	1,160	67	86/72	114/113	14	55
93	Romania	28	80	22.7	393/13	2,560	71	97/94	101/100	.	.
94	Panama	26	75	2.1	58/2	2,120	71	86/85	112/108	7	62
95	USSR	25	44	273.2	5,104/158	4,550*	71	/.	/.	.	.
	[illegible]										
96	Trinidad and Tobago	24	65	1.1	27/1	6,850	70	96/93	107/108	13	50
97	Chile	23	115	11.7	287/8	1,870	67	94/91	112/110	13*	51*
98	Kuwait	23	100	1.6	58/2	17,880	71	73/59	99/97	.	.
99	Jamaica	21	70	2.3	64/2	1,300	70	/.	105/108	.	.
100	Portugal	20	85	9.9	176/4	2,230	71	85/75	122/123	15	49
101	Costa Rica	19	85	2.5	74/2	1,020	73	89*/88*	104/102	12	55
102	Hungary	19	60	10.8	154/3	2,150	71	99/99	100/100	21	36
103	Poland	19	70	36.9	680/15	3,900*	72	99/98	100/100	.	.
104	Bulgaria	17	60	9.1	140/3	4,150*	72	96/93	100/100	.	.
105	Cuba	17	70	9.9	167/3	1,410*	73	96*/96*	112/105	.	.
106	Czechoslovakia	16	30	15.5	250/5	5,820*	72	/.	88/90	.	.
107	Greece	15	55	9.8	155/3	3,920	74	96/85	102/102	.	.
108	Israel	14	36	4.1	97/2	5,370	74	96/91	96/97	18	40
109	New Zealand	13	24	3.2	51/1	7,730	73	/.	104/103	16	45
110	Austria	12	42	7.5	91/1	9,250	73	/.	99/98	.	.
111	Italy	12	48	56.6	726/10	6,400	74	96/95	101/101	18	44
112	Belgium	11	35	9.9	119/2	9,150	73	/.	97/98	22	36
113	German Dem. Rep.	11	44	16.7	209/3	7,180*	73	/.	94/96	.	.
114	USA	11	26	233.7	3,717/50	14,110	74	/.	/.	17	40
115	Australia	10	21	15.3	246/3	11,490	74	/.	105/104	15	47
116	Germany, Fed. Rep. of	10	37	61.3	625/8	11,430	73	/.	/.	20	40
117	Hong Kong	10	55	5.4	95/1	6,000	74	94/77	107/105	16	47
118	Ireland	10	34	3.5	73/1	5,000	73	/.	97/97	20	39
119	Spain	10	50	38.4	648/8	4,780	74	96/90	112/110	19	40
120	United Kingdom	10	24	55.6	714/9	9,200	74	/.	101/102	19	40
121	Canada	9	30	25.0	403/4	12,310	75	/.	107/104	17	40
122	France	9	33	54.3	746/9	10,500	75	/.	111/109	16	46
123	Singapore	9	41	2.5	45/1	6,620	72	92/74	112/107	.	.
124	Denmark	8	23	5.1	57/1	11,570	75	/.	100/101	17	39
125	Netherlands	8	19	14.4	167/2	9,890	76	/.	96/98	22	36
126	Norway	8	20	4.1	51/1	14,020	76	/.	99/100	19	38
127	Switzerland	8	23	6.3	51/()	16,290	76	/.	/.	20	38
128	Sweden	7	17	8.3	87/1	12,470	76	/.	98/99	21	42
129	Finland	6	25	4.8	61/()	10,740	73	/.	100/100	18	38
130	Japan	6	37	118.9	1,473/13	10,120	77	/.	100/100	22	38

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Footnotes to tables

Afghanistan	GNP per capita	1979
Afghanistan	Adult literacy	1979
Mali	Adult literacy	1976
Mali	Primary enrolment	1978
Sierra Leone	Primary enrolment	1979
Sierra Leone	Household income	1967-69
Malawi	Household income	1967-68
Kampuchea	GNP per capita	1974
Mozambique	GNP per capita	1980
Angola	GNP per capita	1980
Burkina Faso	Adult literacy	1975
Bhutan	GNP per capita	1981
Chad	GNP per capita	1982
Chad	Primary enrolment	1976
Guinea-Bissau	Adult literacy	1979
Yemen, Dem.	Adult literacy	1973
Liberia	Adult literacy	1974
Rwanda	Adult literacy	1978
Bolivia	Adult literacy	1976
Benin	Adult literacy	1979
Lao People's Dem. Rep.	GNP per capita	1981
Sudan	Household income	1967-68
Iran (Islamic Rep. of)	GNP per capita	1977
Iran (Islamic Rep. of)	Adult literacy	1976
Iran (Islamic Rep. of)	Household income	1968 urban only
Tanzania, U. Rep. of	Adult literacy	1978
Tanzania, U. Rep. of	Household income	1969
Ivory Coast	Primary enrolment	1979
Zaire	Primary enrolment	1978
Cameroon, U. Rep. of	Adult literacy	1976
Egypt	Adult literacy	1976
Libyan Arab Jamahiriya	Adult literacy	1973
Honduras	Adult literacy	1974
Honduras	Household income	1967
Iraq	GNP per capita	1980
Nicaragua	Household income	1969-71 rural only
Viet Nam	GNP per capita	1978
Viet Nam	Adult literacy	1979
El Salvador	Adult literacy	Age 10+
Guatemala	Adult literacy	1973
Jordan	Adult literacy	1979
Mongolia	GNP per capita	1979
Lebanon	GNP per capita	1974
Albania	GNP per capita	1979
United Arab Emirates	Adult literacy	1975
Korea, Dem. Rep. of	GNP per capita	1979
Korea, Dem. Rep. of	Primary enrolment	1976
Uruguay	Adult literacy	1975
Uruguay	Household income	Montevideo only
USSR	GNP per capita	1980
Chile	Household income	1968
Costa Rica	Adult literacy	1973
Poland	GNP per capita	1980
Bulgaria	GNP per capita	1980
Cuba	GNP per capita	1979
Cuba	Adult literacy	Age 10+
Czechoslovakia	GNP per capita	1980
German Dem. Rep.	GNP per capita	1980

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Signs and explanations

Unless otherwise stated, the summary measures for the four IMR groups of countries are the median values for each group. The median is the middle value of a data set arranged in order of magnitude.

. . Data not available

• UNICEF field office source

( ) Less than half the unit shown

X See footnote at the end of the tables

Y UNICEF field office source; see footnote at end of the tables

T Total

Most of the IMR figures are estimates prepared by the UN Population Division on an internationally comparable basis using various sources. In some cases, these estimates may differ from national figures.

Definitions

Infant mortality rate: annual number of deaths of infants under one year of age per 1,000 live births

GNP: Gross National Product

Life expectancy at birth: the number of years newborn children would live if subject to the mortality risks prevailing for the cross-section of population at the time of their birth

Adult literacy rate: percentage of persons aged 15 years and over who can read and write

Income share: the percentage of private income received by the highest 20% and lowest 40% of households

School enrolment ratios: the *gross* enrolment ratio is the total number of children enrolled in a schooling level – whether or not they belong in the relevant age group for that level – expressed as a percentage of the total number of children in the relevant age group for that level

Main sources

Infant mortality rate: United Nations Population Division and United Nations Statistical Office

Total population: United Nations Statistical Office and United Nations Population Division

Annual number of births: United Nations Population Division

Annual number of infant and child deaths: United Nations Population Division and UNICEF

GNP per capita: World Bank

Life expectancy: United Nations Population Division

Adult literacy rate: United Nations Educational, Scientific and Cultural Organization (UNESCO)

Primary school enrolment ratio: United Nations Educational, Scientific and Cultural Organization (UNESCO)

Share of household income: World Bank

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With the help of the mass media, previous *State of the World's Children* reports have drawn world-wide attention to the potential for a low-cost revolution in child survival and development. This year, despite the continuing crisis of Africa, there is significant progress to report in bringing that revolution about. As the report says, *"the lives of well over a million children have been saved – in the last twelve months – by the recent spread of two of the least expensive of all child protection techniques".*

In particular, the 1986 report documents the sudden surge of progress in immunization which is bringing many developing nations within striking distance of immunizing all their children by the UN target year of 1990 (a target which, if achieved, would mean the saving of another 3·5 million young lives each year).

The 1986 report also carries brief summaries from 20 nations of the attempt to put present knowledge at the disposal of all parents in order to protect not only the lives but also the normal physical and mental development of many millions of children.

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